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OCTOBER 15 1960

AUTOMOTIVE INDUSTRIES

ENGINEERING • MANAGEMENT • PRODUCTION • DESIGN

A CHILTON PUBLICATION



PAGEANT of 1961 Cars

starting on page 55



Did you see Heald's **NEW** Model 171A Internal?

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AUTOMOTIVE INDUSTRIES

A CHILTON MAGAZINE • PUBLISHED SEMI-MONTHLY

OCTOBER 15, 1960

VOL. 123 No. 8

Passenger Cars • Trucks • Buses • Aircraft • Tractors
• Engines • Bodies • Trailers • Road Machinery •
Farm Machinery • Parts and Components • Accessories
• Production and Processing Equipment •
Design • Production • Engineering • Management

Features • • •

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MEMBER

NBP National Business Publications, Inc.



BPA Business Publications Audit of Circulation

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AUTOMOTIVE INDUSTRIES is a consolidation of The Automobile (weekly) and the Motor Review (weekly) May, 1902; Dealer and Repairman (monthly, October, 1893); the Automobile Magazine (monthly, July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918. EDITORIAL EXECUTIVE OFFICES, Chestnut and 56th Sts., Philadelphia 39, Pa. U. S. A. Cable address—Autoland, Philadelphia.

AUTOMOTIVE INDUSTRIES, Published semi-monthly by Chilton Company, Chestnut & 56th St., Phila. 39. Second Class Postage Paid at Philadelphia, Pa. Subscription price: To manufacturers and suppliers to the automotive industries in the U. S., U. S. Possessions and Canada, \$2.00 per year; \$3.00 for 2 years. All Others, \$10.00 per year. Single copies, 75¢. Statistical Issue and Products Guide Issue, \$2.00 each net. National Auto Show Issue \$1.50 per copy net.

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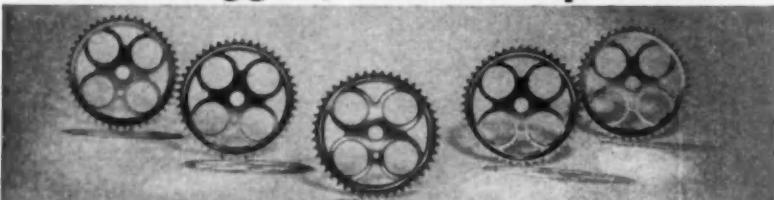
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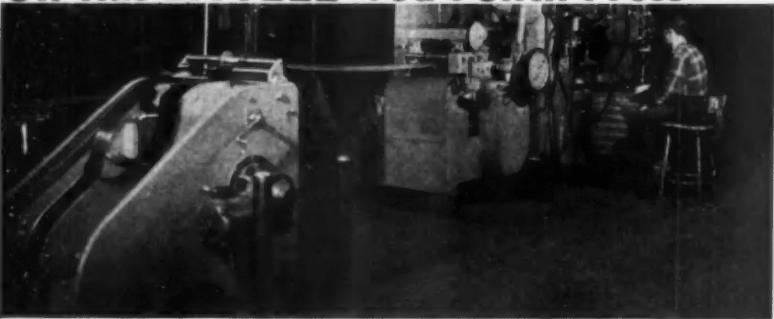
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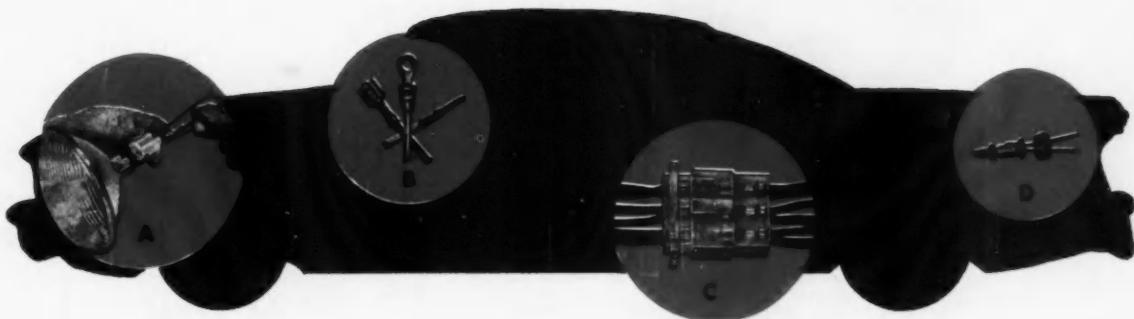
CALENDAR

OF COMING SHOWS AND MEETINGS

Magnesium Association Annual Convention, ClevelandOct. 17-18
Lubrication Conference, A S M E - ASLE, BostonOct. 17-19
42nd National Metal Exposition and Congress, PhiladelphiaOct. 17-21
SPI: "Tooling for the Plastics Industry," New York City....Oct. 19
16th Annual National Conference on Industrial Hydraulics, Chicago Oct. 20-21
1960 Fleet Maintenance Exposition, New York CityOct. 24-27
Technical Meeting and Products Show, Spring Mfg. Assoc., ChicagoOct. 25-27
15th Annual Technical Exposition, American Society of Body Engineers, DetroitOct. 26-28
SAE National Powerplant Meeting, ClevelandOct. 31-Nov. 2
Material Handling Institute Show, Louisville, Ky.Nov. 1-3
SAE National Fuels and Lubricants Meeting, Tulsa, Okla.Nov. 2-4
National Machine Tool Builders' Assn., 59th Annual Meeting, Hot Springs, Va.Nov. 2-4
American Foundrymen's Society, Mich. Regional Conference, Saginaw, Mich.Nov. 3-4
American Institute of Industrial Engineers, Annual Regional Conference and Convention, BostonNov. 3-4
The Society of Die Casting Engineers, Die Casting Exposition and Congress, DetroitNov. 8-11
ASTME, Western Tool Show, Los AngelesNov. 14-19
ASME, Winter Annual Meeting, New YorkNov. 26-Dec. 1
National Exposition of Power and Mechanical Engineering, New YorkNov. 28-Dec. 2
Semi-Annual Meeting, Malleable Founders Society, Cleveland...Dec. 2
Automotive Electric Association, 43rd Annual Meeting and 24th Annual Mfg.-Dist. Conference, ChicagoDec. 2-9
Industrial Building Exposition and Congress, New YorkDec. 12-15

1961

SAE, International Congress and Exposition, DetroitJan. 9-13
ISA, Winter Instrument-Automation Conference & Exhibit, St. LouisJan. 16-19
29th Annual Meeting, Institute of the Aeronautical Science, New YorkJan. 23-25
12th Annual Plant Maintenance & Engineering Show, Chicago.Jan. 23-26
13th Western Metal Exposition & Congress, DetroitMar. 20-24
Spring Technical Meeting, Pressed Metal Institute, New York.Mar. 22-24
ASTME, 1961 Engineering Conference & Exhibit, New York..May 22-26



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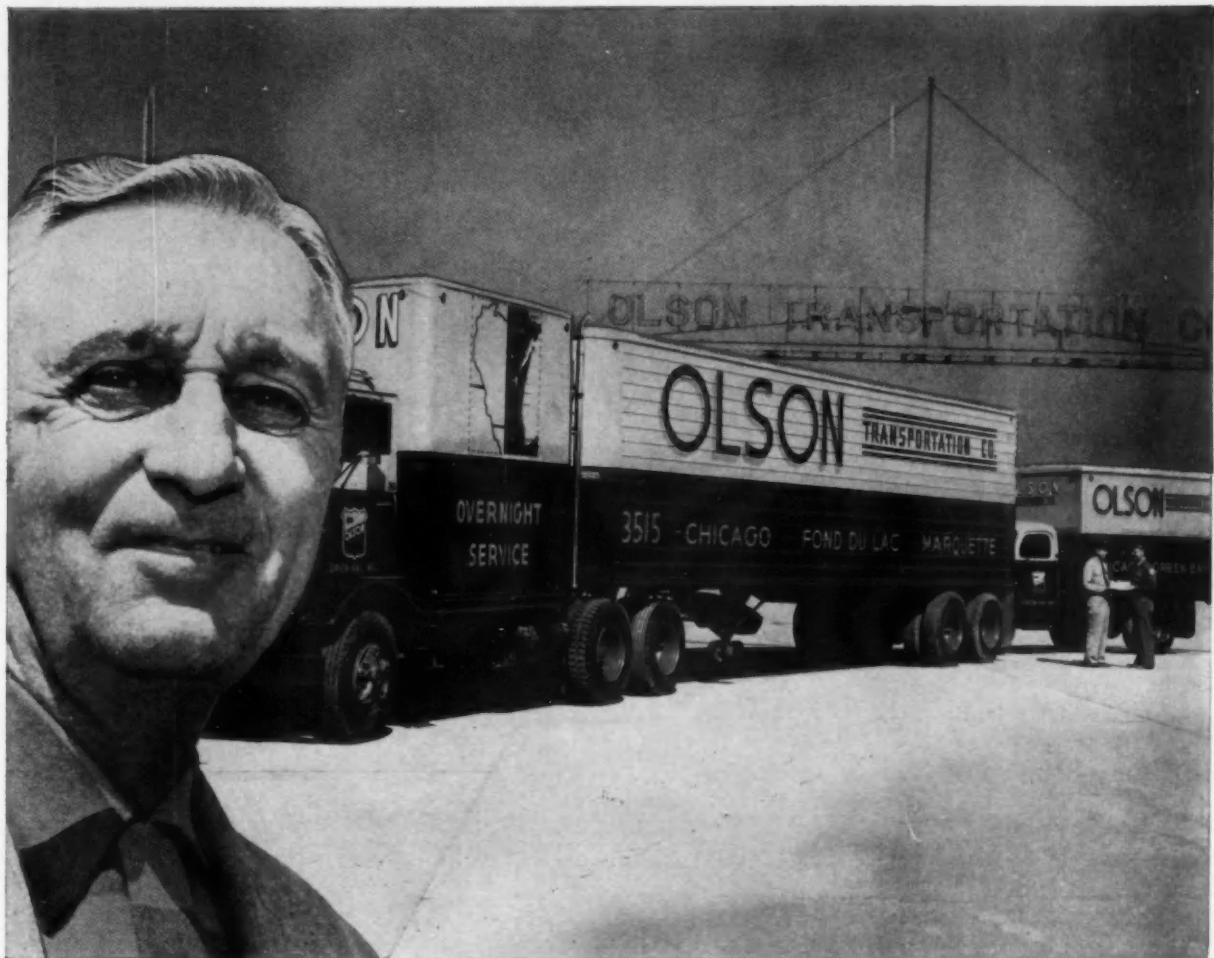
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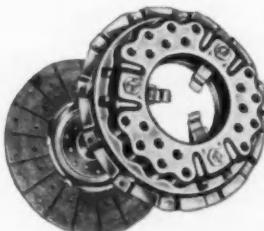
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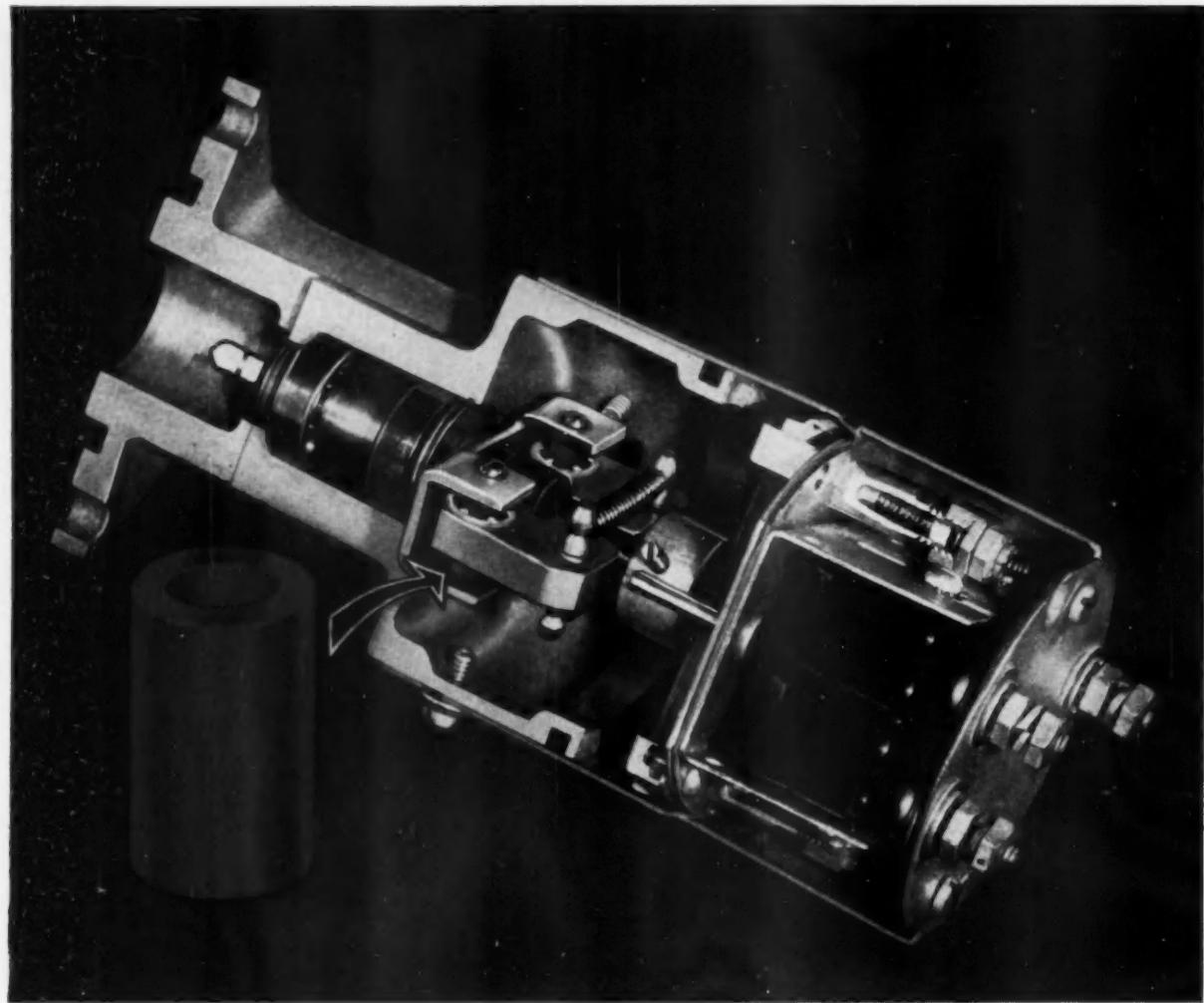


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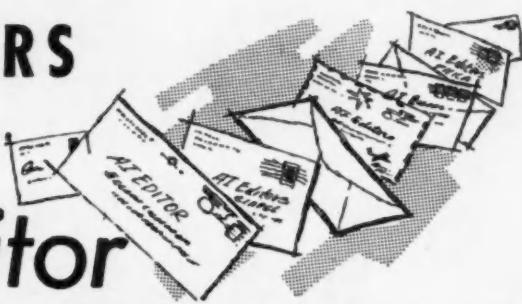
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to the

Editor



Readers' opinions or requests for additional information on material appearing in the editorial pages of AUTOMOTIVE INDUSTRIES are invited for this column. No unsigned letters will be considered, but names will be withheld on request. Address Letters to the Editor, AUTOMOTIVE INDUSTRIES, 56th & Chestnut Sts., Philadelphia 39, Pa.

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I would appreciate receiving reprints of the article "Induction Hardening Axle Shafts" printed in the August 15 issue of AUTOMOTIVE INDUSTRIES.

D. A. Webster
Works Metallurgist
International Harvester
Chicago, Ill.

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Tiffin, Ohio

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Account Supervisor
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Please send me a copy of your article entitled "Scheduling Farm Tractor Production at Allis-Chalmers" which appeared in your May issue.

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Buchanan, Mich.

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Manager Automotive Sales
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United States Rubber Co.
Detroit, Mich.

RUSSIAN TRACTOR

Your illustration of the Russian Ukraine T-90 tractor with two-foot wide tires for traversing soft ground is most interesting.

Apparently the Russians must plan to move in straight paths because there appears to be little or no provision for cramping the wheels in order to steer the vehicle.

George R. Cooper, Jr.
Walter Motor Truck Co.
Voorheesville, N. Y.

• Another Soviet "first"?—Ed.

READER SERVICE

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I would like to contact them for some wheel design information.

Paul Weisinbach
R & M Automotive
Cleveland, Ohio

• First National Tower, Akron 8, Ohio, Mr. C. G. Hoover, Exec. V.P.—Ed.

An illustration showing a collection of various fasteners, including several screws of different sizes and types, some bolts, and some washers, arranged against a dark background.

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Whether your job requires a 1, 20 or 80 micro-inch finish, setup is fast and easy. Nothing is left to the operator's skill or judgment. Stone pressure and grade, and reciprocation rate are preselected to produce the finish you require, for job lots or large production runs.

It will pay you to find out how Gisholt Superfinish can cut costs, improve quality and lengthen service life on your standard or problem parts. Ask your Gisholt Representative or write for Bulletin 1169.



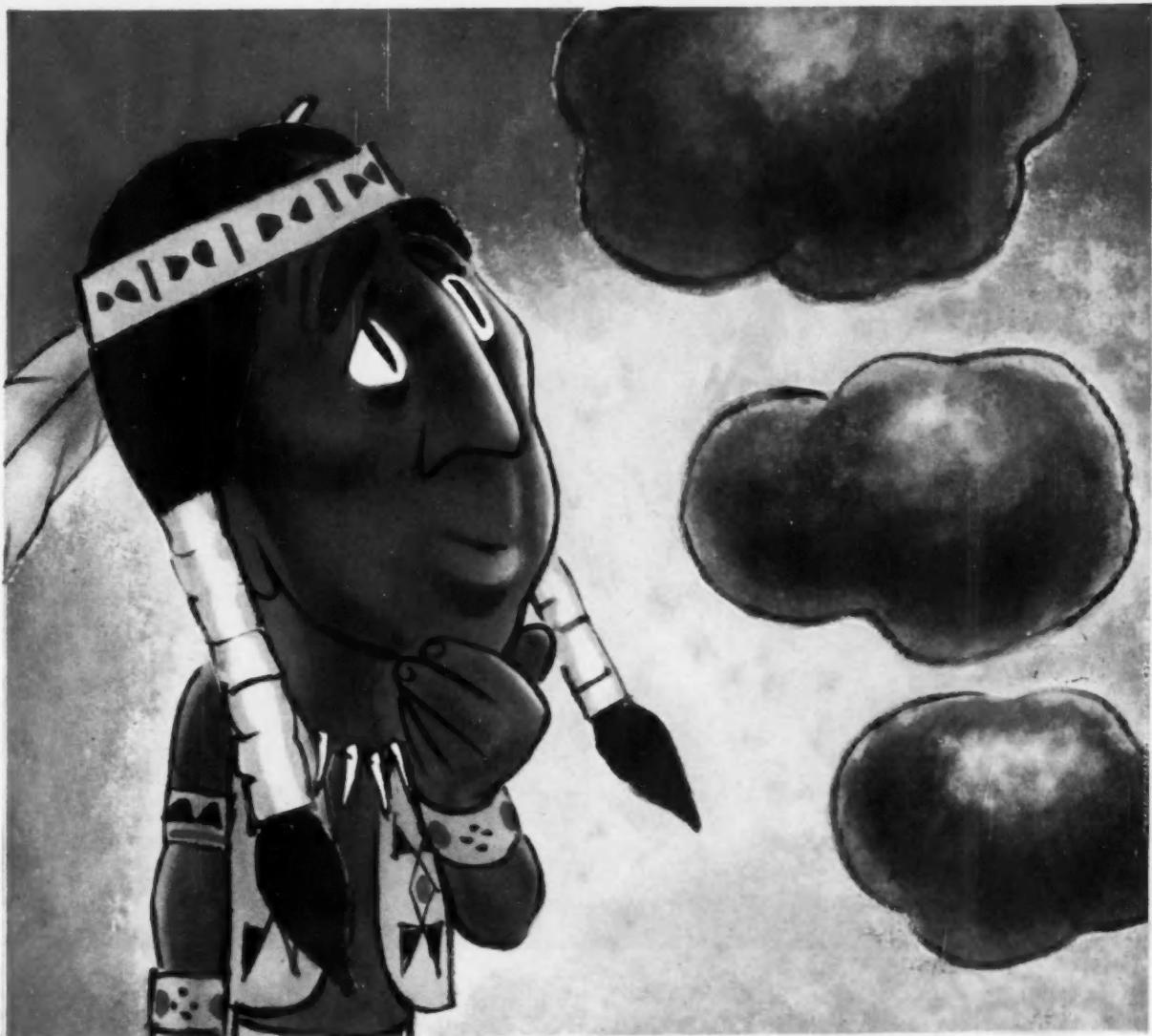
GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin

Investigate Gisholt's Extended
Payment and Leasing Plans

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantees



YOU CAN'T AFFORD TO WAIT FOR SMOKE SIGNALS!

Smoke signals from an engine are sure signs of excessive engine wear and poor engine performance! To protect the reputation of his product, an engine manufacturer must guard against these tell-tale smoke signals before his product leaves the factory. That's why more engine manufacturers install Fram Filters as original

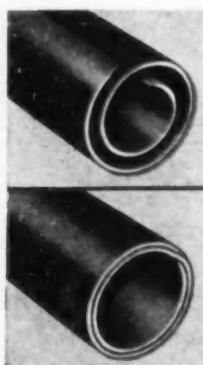
equipment than any other brand. Why not let Fram's extensive research and testing facilities go to work for you? Fram leads the field in research and Fram engineers always come up with the most efficient and economical solution to every filtration problem! **FRAM CORPORATION**, Providence 16, R. I. GEneva 4-7000.

YOUR FIRST LINE OF ENGINE PROTECTION

FRAM OIL AIR FUEL WATER **FILTERS**



There's almost no limit to the things Bundy can mass-fabricate



Bundyweld is the original tubing double-walled from a single copper-plated steel strip, metallurgically bonded through 360° of wall contact for amazing strength, versatility.

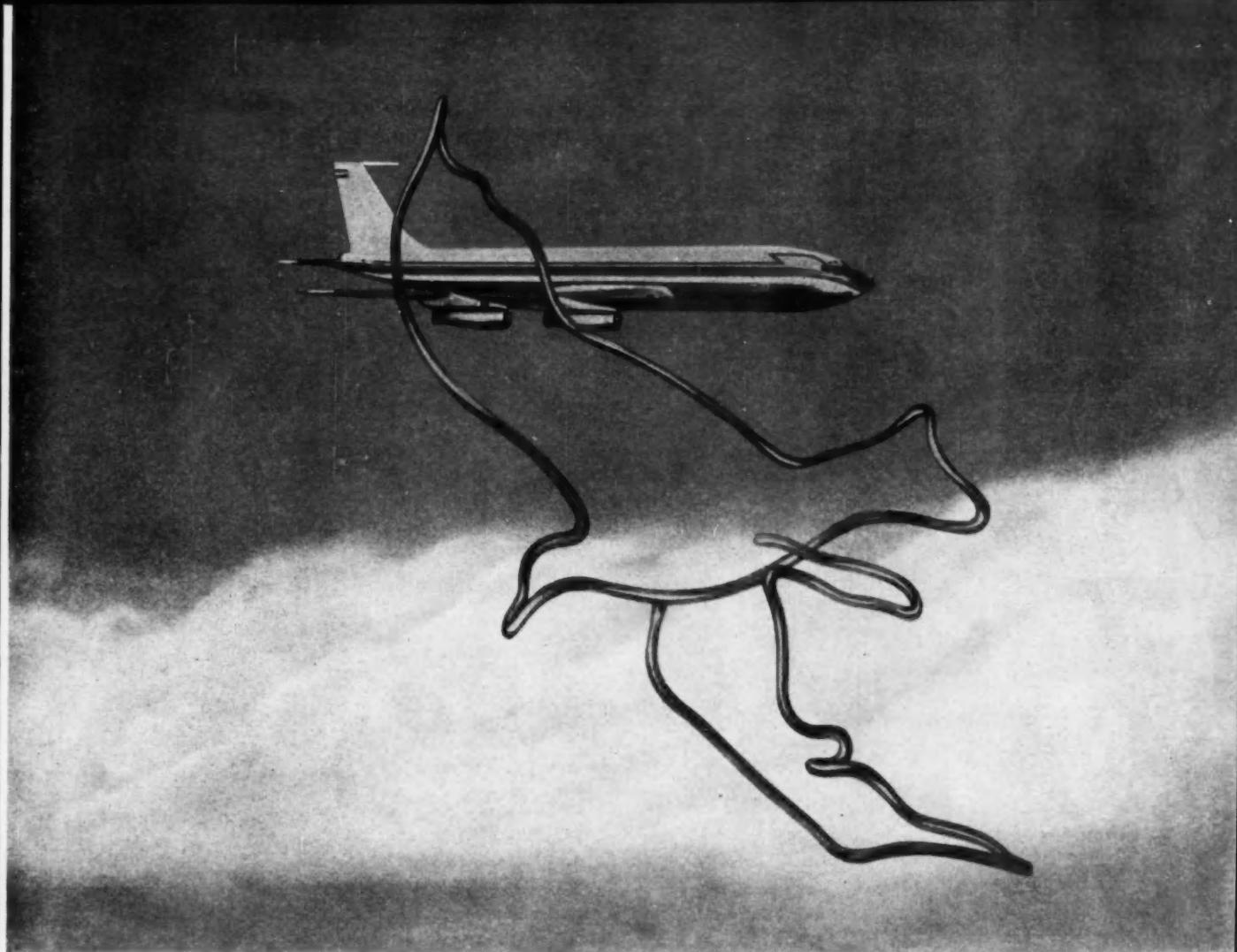
Bundyweld is light-weight, uniformly smooth, easily fabricated. It's remarkably resistant to vibration fatigue; has unusually high bursting strength. Sizes up to $\frac{5}{8}$ " O.D.

Maybe you've got a tubing component that's difficult to fabricate. But complex or simple—it will still pay you to talk to Bundy. Here's why:

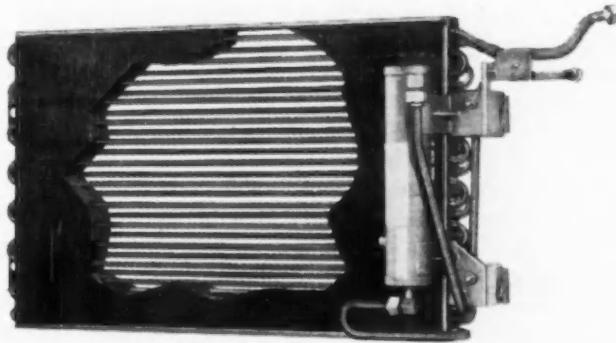
Your part will be made from Bundyweld—the original steel tubing double-walled from a single copper-plated steel strip. Extra strength and resistance to vibration fatigue have made Bundyweld the safety standard of the automotive industry. Meets ASTM 254; Government Specification MIL-T-3520, Type III.

And you'll get close tolerances, too. Bundy engineers check every job to see if design modifications can cut costs or improve quality. Then your component will be mass-produced on machines developed by Bundy to give you precision and uniformity—and low unit cost.

Need help with a tubing problem? Bring it to Bundy. Call, write, or wire: Bundy Tubing Company, Detroit 14, Michigan.



Ford owners ride in cool comfort with this factory installed air conditioner built by the McCord Corp. Bundyweld steel tubing used in the condenser coil and connecting tubes not only provides leakproof dependability, but also results in important cost savings.



There's no substitute for the original

BUNDYWELD® TUBING

WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING • AFFILIATED PLANTS IN AUSTRALIA, BRAZIL, ENGLAND, FRANCE, GERMANY, ITALY, JAPAN

BUNDY TUBING COMPANY • DETROIT 14, MICH. • WINCHESTER, KY. • HOMETOWN, PA.

Circle 116 on Inquiry Card for more data

Look—**TERRA-TIRES** roam through 12-inch mud!



Photo taken through the courtesy of Crain Brothers, Grand Chenier, La.—builders of the "Marshbuggy"

This strange vehicle is called a "Marshbuggy" — and it rolls through some of the mushiest, muddiest marshland in the world on Goodyear's famous Terra-Tires. Try wading through this Louisiana swamp and you'd sink knee-deep in oozing mud. And the stuff is so sticky that it clings like wet paste. Yet Terra-Tires are at home in these treacherous bogs—often carry cargoes weighing up to 4000 pounds *in addition to* the weight of the buggy. This amazing flotation gives Terra-Tires the ability to "go anywhere" — up rough, rocky grades — over soft, shifting sand — even through powder-fine snow. What's the secret of this remarkable mobility? Low inflation pressure — low rolling resistance — great flexibility and surprising strength. Can Terra-Tires solve a mobility problem for you?

DESIGNERS: By designing vehicles from the start to utilize the unique engineering advantages of Terra-Tire transportation, substantial savings in space and weight can be realized. For more information, write Goodyear Tire & Rubber Company, Aviation Products Division, Dept. V-1733, Akron 16, Ohio.

Look where Terra-Tires
are working right now!



Bringing bananas out of marshy groves.



Carting golf equipment without harm to greens or fairways.

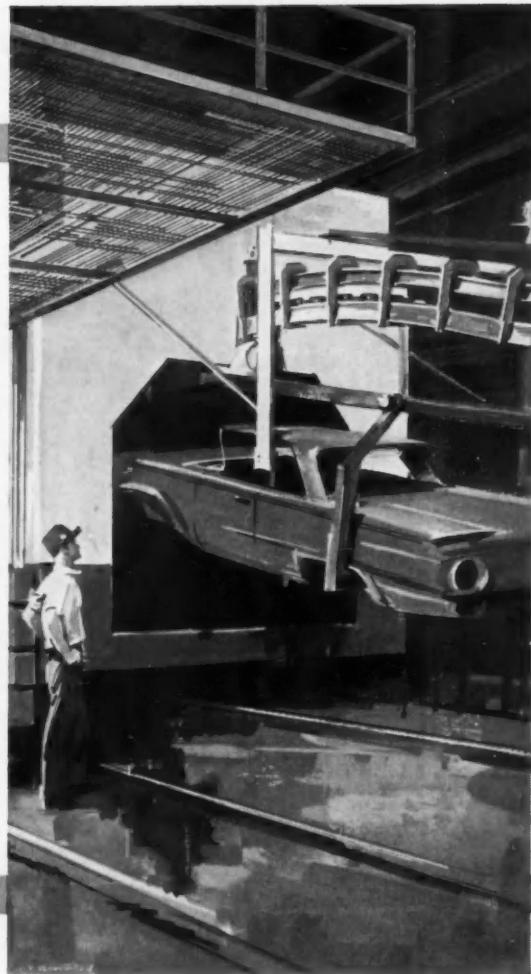


Cleaning sandy beaches without sideslip.

GOOD YEAR

Terra-Tire—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Automotively speaking... AMCHEM SPEAKS YOUR LANGUAGE!



Amchem service in automotive phosphating processes goes far beyond the sale of chemicals.

For instance, the Amchem "Technical Service Report" developed over 13 years ago has been adopted as virtually a standard form among leading automotive manufacturers. This monthly report incorporates all pertinent chemical and equipment performance data in one convenient form, has manifold advantages in keeping local and district management informed of line conditions for chemical control and maintenance, produces higher levels of quality through extra vigilance in controlling chemical baths and equipment.

In the past Amchem service has achieved signifi-

cant advances in automotive prepaint finishing, among them—Deoxidine, the first corrosion-proofing treatment for use in mass production of steel automobile bodies; the first spray process for rust-proofing steel; and Granodine, the spray phosphating process that has become the accepted standard in industry.

Amchem has spent a lifetime (all 46 years of its corporate existence) providing phosphating services to the automotive field. If your requirements embrace more than phosphating chemicals alone, look to Amchem's Metal Protection Laboratories where, automotively speaking, we speak your language!



AMCHEM PRODUCTS, INC.

(formerly American Chemical Paint Co.)
AMBLER, PA.

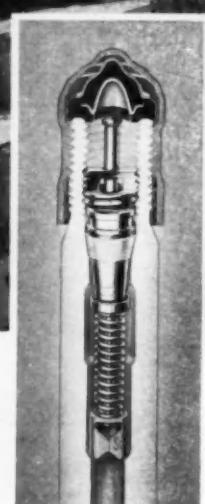
Detroit, Mich., St. Joseph, Mo., Niles, Calif., Windsor, Ont.

Amchem, Granodine and Deoxidine are registered trademarks of Amchem Products, Inc.

The American Automotive Industry—the world's
Thousands of extra vehicle miles



*Schrader's famous tire valve operating principle
is the Ace of Standardization for today's
longer lasting, better performing tires.*



*greatest enterprise—depends on tire accomplishments
in every tire and tire valve...
through rubber chemistry*

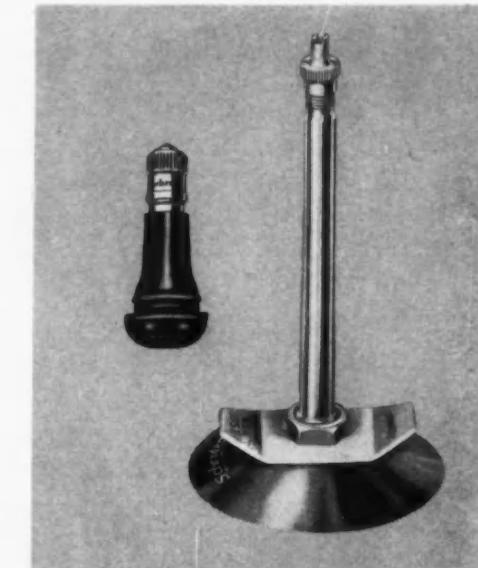


The Automotive Industry consumes 60% of the world's rubber, chiefly in the form of tires*. These tires are amazing . . . they give superior performance . . . they are economical. Reduction of aging, deterioration and wear of tire valve rubber is a result of specialized companies working together. Only by utilizing combined skills, experience and facilities can tire valves be produced to match each others' performance where it counts . . . on the vehicle itself. Count on Schrader's finest rubber chemistry techniques and facilities to supply quality tire valves for any tire-equipped vehicle anywhere in the world.

*Encyclopedia Britannica



NO ONE RUBBER meets *all* requirements of *all* valves. Schrader adds special ingredients to natural rubber, SBR, butyl, neoprene, and other kinds to achieve a balanced combination of desired properties for each specialized valve—tube—tire.



BONDING RUBBER to metal valve inserts requires multiple matching: a metal alloy, to an etching technique, to a rubber compound . . . plus, for tubes, the additional requirements of rubber-to-rubber bond.



RESULT: The tire on every vehicle rolling gives the driver maximum safety and economy. Schrader rubber chemistry makes a major contribution to world-wide vehicle performance.

Schrader®
a division of **SCOVILL**

FIRST NAME IN TIRE VALVES

FOR ORIGINAL EQUIPMENT AND REPLACEMENT

Circle 119 on Inquiry Card for more data

AUTOMOTIVE INDUSTRIES, October 15, 1960

21

BOND FAILURES CAN BE PREVENTED!

Here's how to stop 13 of them...

Type of Failure	Solution
THERMOSETTING ADHESIVES <ul style="list-style-type: none">• Cohesive failure• Adhesive failure from metal• Adhesive failure from substrate other than metal• Cellular areas in adhesive line	<p>Check film with solvent used in adhesive. If solvent softens the adhesive film or becomes tacky, this indicates insufficient cure. Make sure bond line time and temperature is used.</p> <p>If metal surface has a white, clean appearance, check cleaning technique.</p> <p>Try prime coat of diluted adhesive, also check compatibility.</p> <p>Increase pressure and/or adhesive.</p>
CONTACT ADHESIVES—room temperature setting <ul style="list-style-type: none">• Tacky film• Shiny areas• No bond• Failure in adhesive from metal• Failure from substrate other than metal	<p>If film should dry hard but remains tacky, the cause may be entrapped solvent or migration of plasticizer from one substrate.</p> <p>Poor contact, insufficient pressure or insufficient amount of cement.</p> <p>If heat reactivated type, adhesive was too cool at time of assembly or poor compatibility.</p> <p>Improper cleaning.</p> <p>Incompatible or unclean surfaces.</p>
HOT MELT <ul style="list-style-type: none">• No bond	<p>Incompatibility, adhesive too cool at time of assembly. Parts too cool at time of application of adhesive.</p>
EPOXY BASE ADHESIVES AND CASTING COMPOUNDS <ul style="list-style-type: none">• High exotherm• Tacky film or casting• Flexible casting or film of rigid adhesive or casting compound	<p>Mix lower volume and pour mixed material into shallow tray. Cool base and activator before mixing or use Metermixing equipment.</p> <p>Improper base activator ratio, improper mixing of base and activator, improper cure. Check bond line temperature.</p> <p>Improper mixing of base and activator, improper base and activator, improper cure. Check bond line temperature.</p>

Bond failures can be prevented! Raybestos-Manhattan's adhesive experts also have solutions to less common causes of bond failures . . . based on more than 20 years' experience in the production of bonded assemblies and the manufacture of adhesives, coatings and sealers. Why not call on them today for the answers to your adhesive problems—no cost or obligation, naturally.



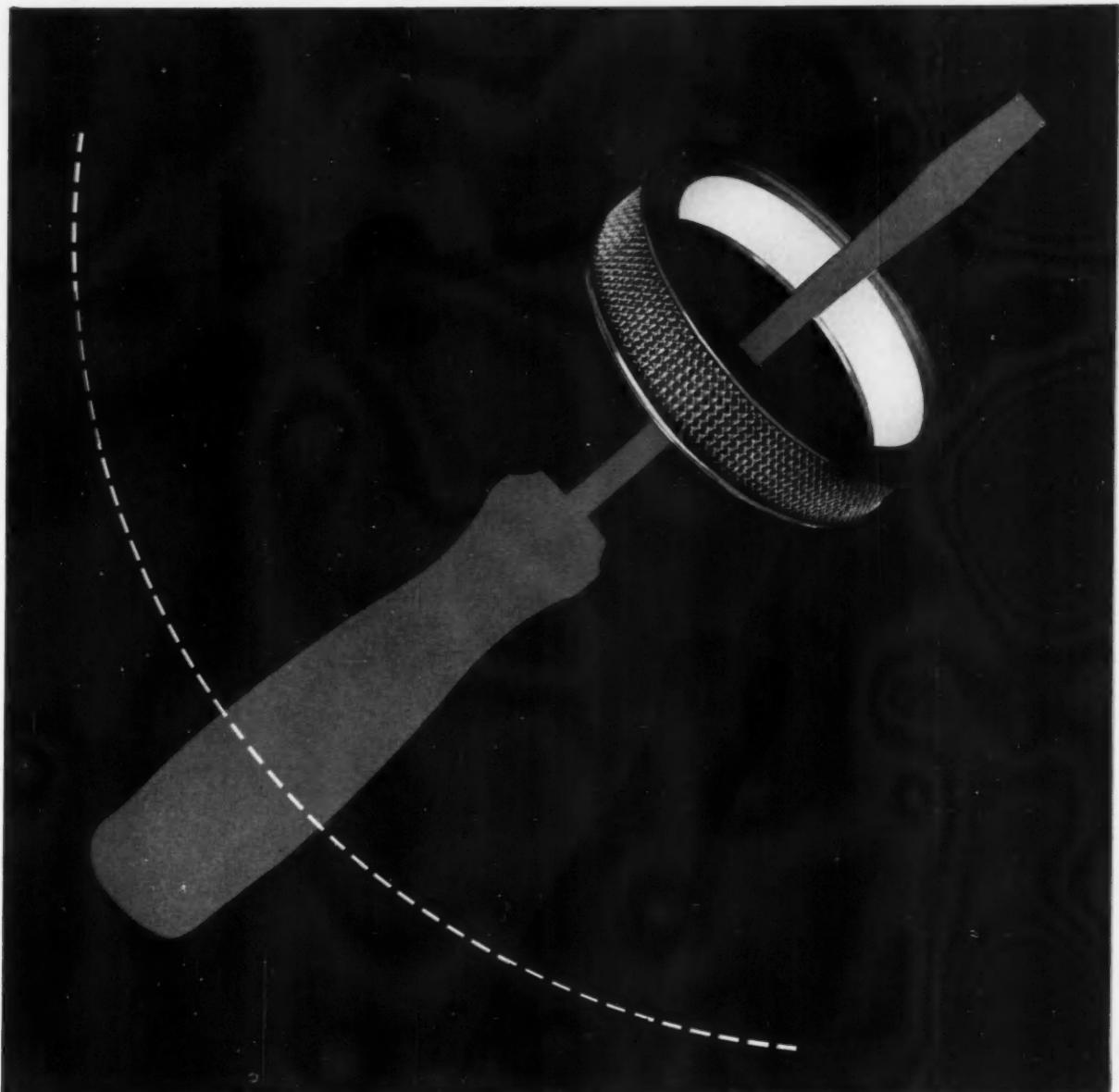
R/M Bulletin No. 700 is packed with helpful technical information on Ray-BOND adhesives. Write for your free copy now.

RAYBESTOS-MANHATTAN, INC.

ADHESIVES DEPARTMENT, Bridgeport, Conn. • Chicago 31 • Detroit 2 • Cleveland 16 • Los Angeles 58



YOU CAN'T BEAT AC FOR PRODUCT KNOWLEDGE



Here's a new twist for your Air Cleaner problems

If the products you manufacture use air cleaners, let AC's 35 years of air cleaner know-how assist you. Consider these facts: AC air cleaners are used as original equipment by 39 engine builders . . . AC has produced over 2492 different kinds of air cleaners . . . AC has 23 highly trained engineers working on air cleaners exclusively . . . AC air cleaner engineers spend over 2700 hours annually working directly with customers on experimental development . . . AC air cleaners are continually and periodically tested on a fleet of 540 cars . . . AC has a complete staff of skilled technicians working on prototype air cleaners and customer samples. Call the nearest AC office below. You'll get fast ACtion at AC!

AC SPARK PLUG  THE ELECTRONICS DIVISION OF GENERAL MOTORS

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DETROIT—General Motors
Bldg. Trinity 5-9197

PHILADELPHIA—7 Bala Ave.
Mohawk 4-1980, Bala-Cynwyd

LOS ANGELES—7086 Telegraph Rd. RAYmond 3-5171



RELIABLE PRODUCTS
HELP YOU SELL



**There's an
EATON
ROLL PUMP
for every
Power Steering
Requirement**

Eaton Roll Pumps, performing reliably on leading motor cars, trucks, and tractors, have a number of proven advantages including compact, space-saving design, high efficiency, quiet operation, and simple construction.

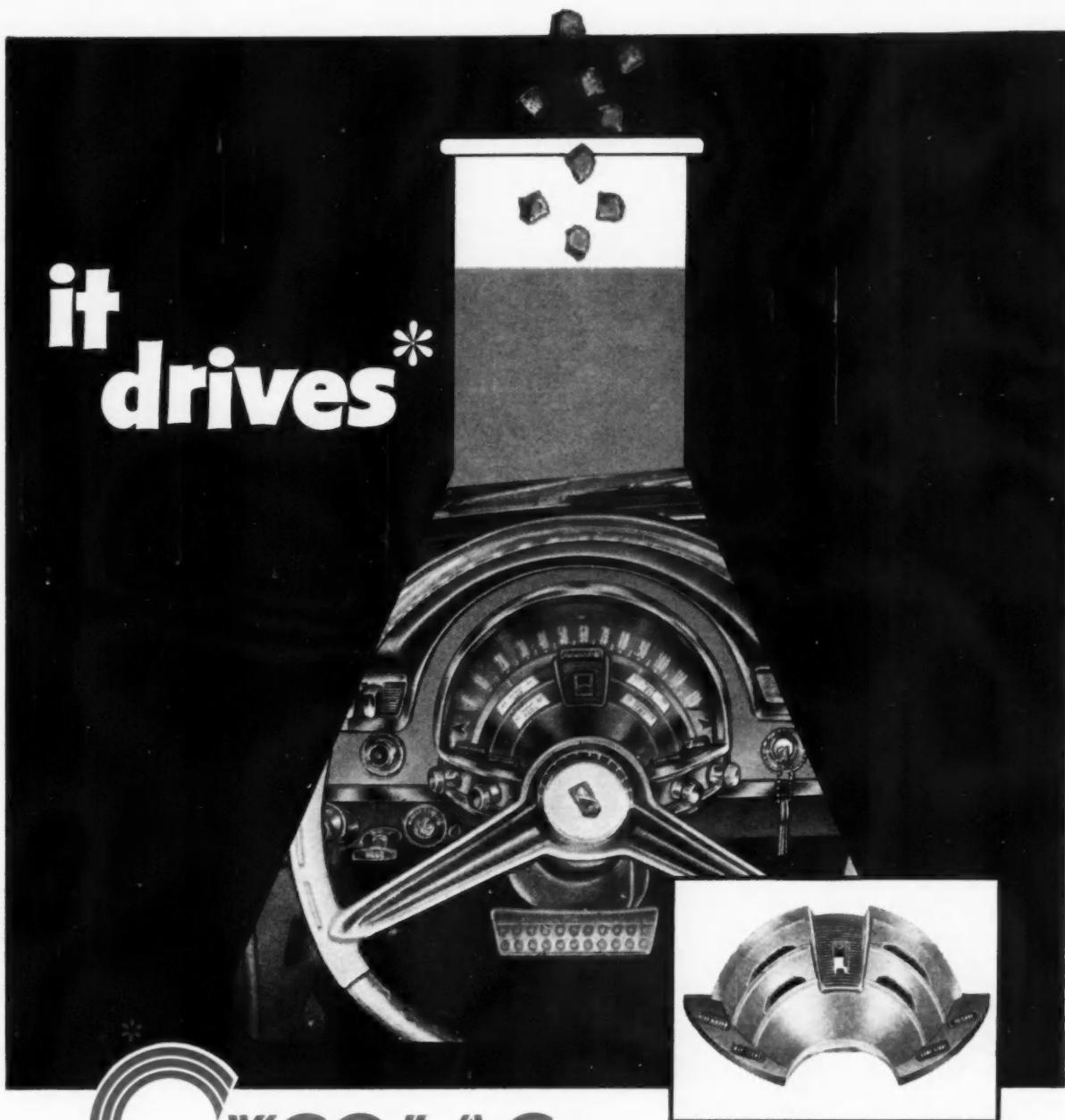
Eaton Pump Division sales engineers will be glad to work with you in selecting or developing better pumps to meet your specific requirements. Call on us.



EATON

PUMP DIVISION
MANUFACTURING COMPANY
9771 FRENCH ROAD • DETROIT 13, MICHIGAN

it
drives*



CYCOLAC®
THE BORG-WARNER PLASTIC THAT'S TOUGH, HARD, AND RIGID

Every year, the auto industry finds new applications for CYCOLAC—to the tune of important savings and an improved appearance for many products.

The 1960 Chrysler instrument panel you see above is a typical example.

This unique panel, molded of Borg-Warner CYCOLAC, cuts production costs because it replaces expensive die-cast metal with economical molded plastic.

It also replaces chrome plating with vacuum plating . . . another cost-economy. Product-appearance is improved because the toughness, hardness and rigidity of CYCOLAC enable it to keep its "like new" look for many years.

CYCOLAC Better in more ways than any other plastic

GET THE FACTS—WRITE TODAY!

MARBON CHEMICAL
WASHINGTON



DIVISION BORG-WARNER
WEST VIRGINIA



ENJAY BUTYL RUBBER ...

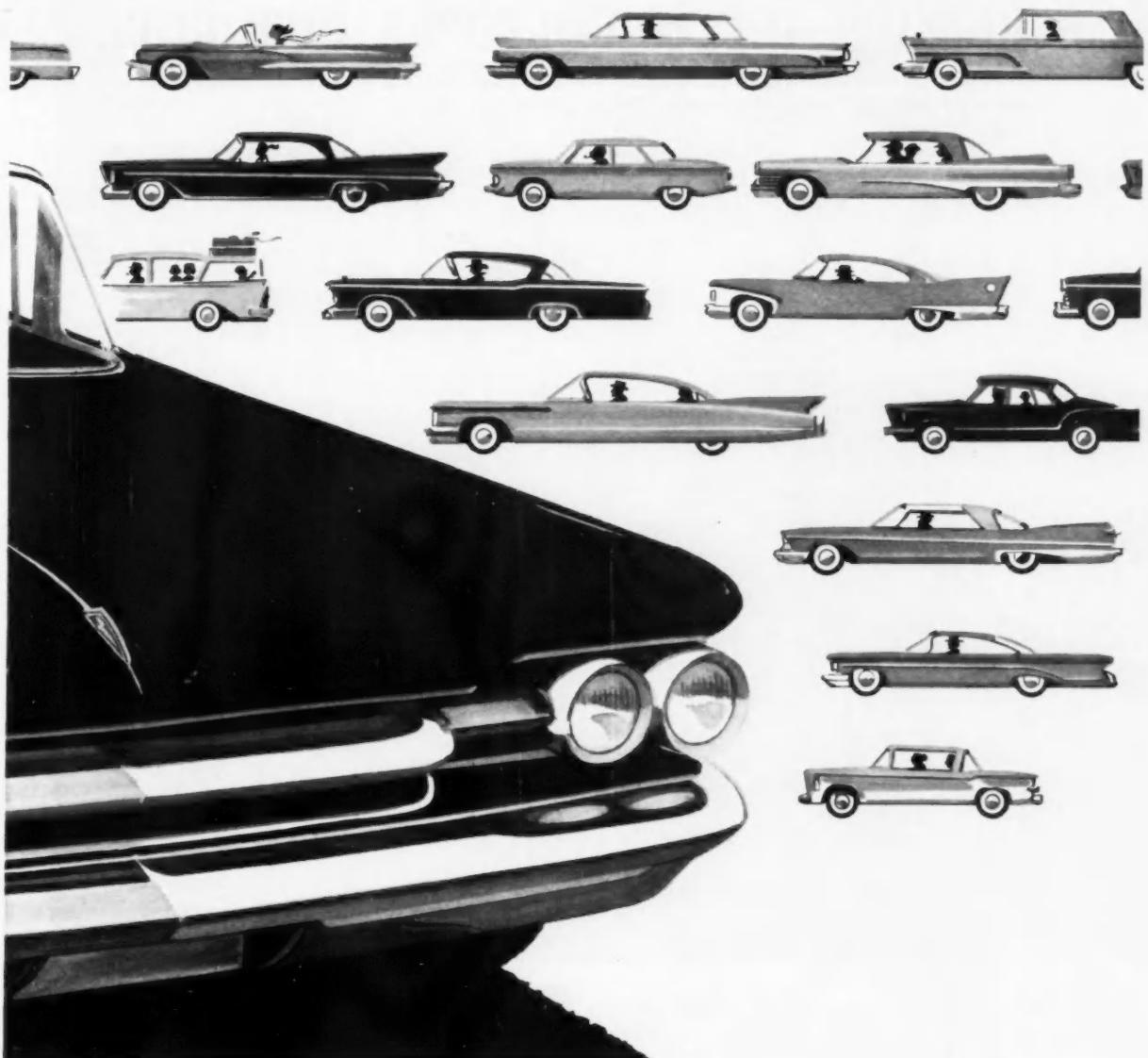
Parts made of high performance Enjay Butyl rubber are to be found on every one of today's U.S.-made cars! Over 100 applications . . . dozens of separate parts on some cars!

Butyl was selected because of its many outstanding properties . . .

Resists weathering, sunlight, ozone, moisture, mildew — in weather-stripping, seals, convertible tops and other parts.

Deadens vibration and sound Smooths the ride — in tires, tubes, and drive-shaft insulators. Muzzles squeaks — in shims, sheet-metal seals and insulation.

Absorbs shock Dynamically softer as well as shock absorbent — cushions bodies, bumpers, and motors.



is used on all 1961 U.S. cars!

Beats the heat Stands up in under-the-hood service—in radiator hose, firewall grommets, hood bumpers, and gaskets.

Resists tear, flex, abrasion Checks deterioration—in cable bushings, accelerator bellows, pedal pads and gear-shift lever boots.

Enjay Butyl rubber is second to none in good looks . . . it's easy to color and finish smoothly. For more information contact the nearest Enjay office.

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY

AUTOMOTIVE INDUSTRIES, October 15, 1960

Circle 123 on Inquiry Card for more data



He's looking for tomorrow's headlamp



The purpose of this scientific analysis is to develop more efficient headlighting for the cars of tomorrow . . . headlighting that will meet the exacting, yet divergent demands of higher speed turnpikes and heavier in-city traffic.

Here Tung-Sol research and development engineers compare the headlamp beam pattern produced by a newly designed sample lens (right) with that of a standard production model by the use of special aiming heads under laboratory conditions.

This continuing project is an example of the research and development that keeps Tung-Sol to the fore in the quality mass production of headlamps. It is historical fact, too, that Tung-Sol has made significant contributions to major headlighting improvements since the turn of the century when it produced the first successful electric headlamp. Automotive Products Division, Tung-Sol Electric Inc., Newark 4, N. J. TWX: NK193.



TUNG-SOL®

HEADLAMPS • MINIATURE LAMPS • FLASHERS



that hasn't been eliminated by Schlegel glass-run channel liners

Annoying car window rattles have been squelched permanently.

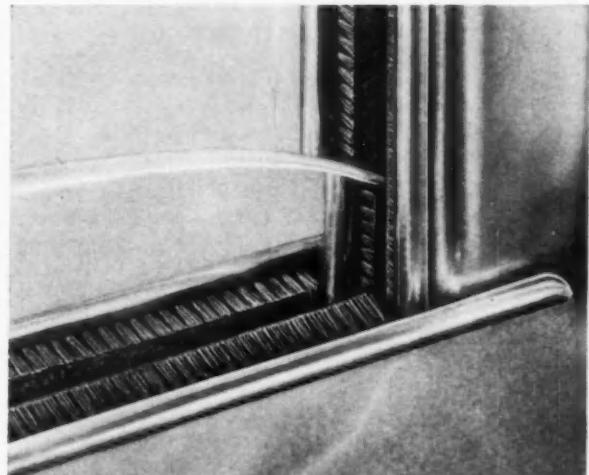
Every moving window in this automobile is snuggled in a channel of deep, silent pile liner by Schlegel. When the windows are moved, they slide effortlessly in a uniformly-dense woven pile, furnished to precise specifications by Schlegel.

Outside noises, too, are muffled by Schlegel pile liners. In rain or wind, the windows are sealed almost hermetically.

This seal is due largely to the resilience of Schlegel pile. It hugs the glass surface evenly, flexing against wavy surfaces to hold a constant seal. This quality pile will retain its wear-resistance for years to come.

Try a sample of Schlegel woven pile liner in your own wear-testing lab. Run it through a few hundred thousand ups and downs. You'll see why Schlegel woven pile stays dense—to smother rattles for years to come.

Specify Schlegel woven pile liners in your glass-run channels. You'll be in good company, for automotive engineers have been specifying Schlegel pile liner since glass windows were first used in automobiles.



This glass-run channel, with woven pile by Schlegel, offers friction-free, noiseless window movement.

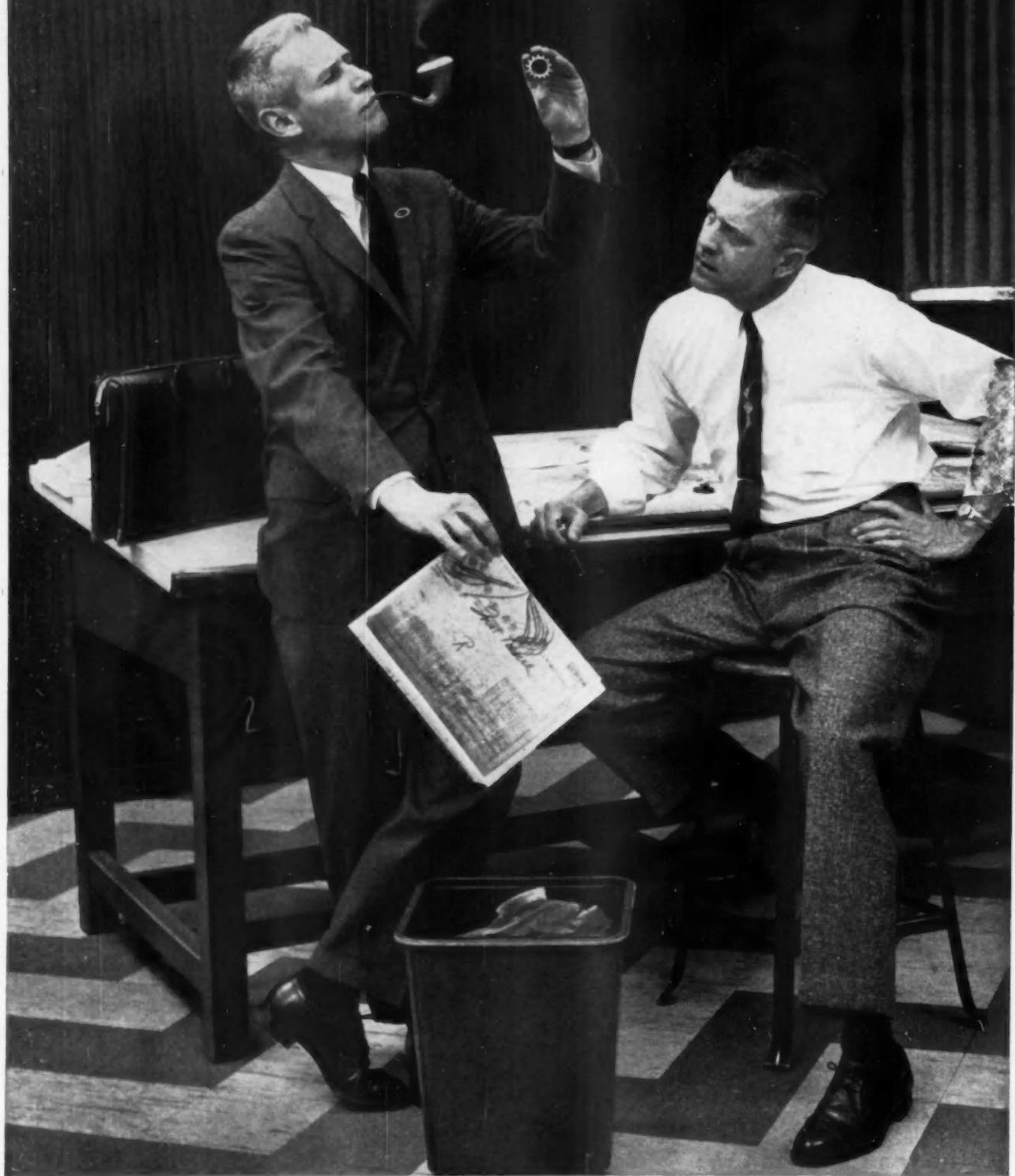
Schlegel

SERVING THE AUTOMOTIVE INDUSTRY

SCHLEGEI MANUFACTURING COMPANY

1555 Jefferson Rd., Rochester 23, N.Y. In Canada: Oakville, Ont.

THE AMPLEXOLOGIST





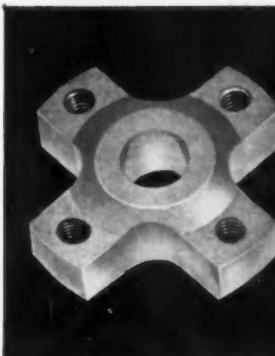
The Amplexologist has a high regard for prospective customers' blueprints. He finds it necessary upon occasion, however, to put them respectfully aside. Especially when he's told: "We tried to make this part out of powder metal a couple of years ago but the supplier couldn't meet our specs."

The Amplexologist, you see, has heard this song before. That's why he puts down the prints and picks up the part. And starts probing.

What does this part have to do? Under what conditions? Any special strains? Impact? Where? What about the configuration? Is this contour functional? Are these sharp angles necessary?

Often as not, the answers to these questions hit pay dirt. They usually reveal, in fact, that with a little redesigning another "impossible" part can, after all, be made better and cheaper through advanced powder metallurgy (i.e. Amplexology).

We're happy to say that most manufacturers are eager to eat their own specifications anytime they can save thousands of dollars and still maintain (or improve) quality. Their willing appetite has helped make us the world's largest and most experienced producer of powder metal parts. One more reason why manufacturers say, **When it comes to powder metallurgy—Amplex has the answer.**



A LITTLE RE-DESIGNING . . .

The part shown is an engine fan-pulley hub. It was formerly a solid circular casting. The manufacturer had to machine the face, bore the ID, drill and tap four holes. The Amplexologist re-designed the hub into its present cloverleaf shape—to reduce weight and cost of material. It is now being produced by powder metallurgy as a finished precision part that requires no machining—except tapping the holes. Total savings about 33%.

AMPLEXOLOGIST

SEND COUPON . . . if you'd like to talk over your product with the Amplexologist. Don't hesitate. He's always happy to get out of the office.

AMPLEX DIVISION • CHRYSLER CORP. • Dept. A-10
P.O. Box 2718 • DETROIT 31, MICH.

Please have the Amplexologist call to look into the possibility of using powder metal parts in our product.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

PRODUCT _____

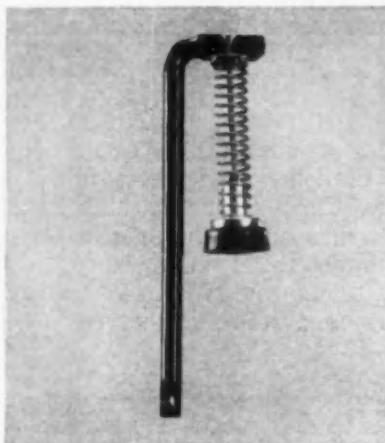
AMPLEX

DIVISION
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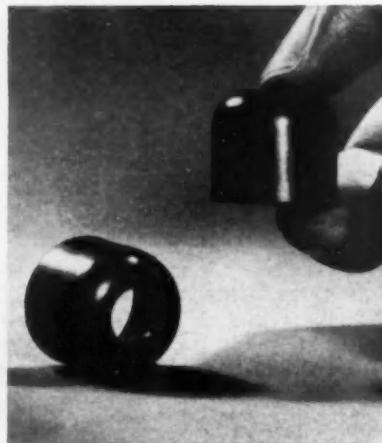


HOW YOU CAN HANDLE TODAY'S HIGH-OCTANE FUELS AND E-P LUBRICANTS

DU PONT VITON® SYNTHETIC RUBBER MEETS THE NEED FOR HEAT AND FLUID RESISTANT SEALS, TUBING AND DIAPHRAGMS



VITON RESISTS AROMATIC FLUIDS A major manufacturer of truck carburetors found that the increased aromatic content of gasoline caused rapid failure of the synthetic rubber piston cups in the accelerating pump. He replaced the pump cups with new ones made of VITON and solved the problem.



VITON RESISTS HOT LUBRICATING OIL Valve stem seals of VITON are in regular commercial use in a line of heavy-duty truck engines. After 150,000 miles an engine was dismantled and parts inspected. VITON seals showed virtually no wear, maintained good oil control despite high temperatures.



VITON RESISTS EXTREME HEAT A leading aircraft manufacturer needed a firewall material that would stay flexible and serviceable at 500° F. Asbestos, coated with VITON, provided the solution. This VITON fire seal resists jet fumes, ozone, corona, withstands the heat and vibration generated by Mach 2 speeds.

Du Pont VITON combines outstanding heat resistance (up to 400° F. in continuous service; 600° F. intermittently) with excellent resistance to hydraulic fluids, aromatic fuels and extreme pressure lubricants. Result: a new design material with a wide range of automotive and aircraft applications.

VITON, in contact with extreme heat and a wide variety of fuels and lubricants, is dimensionally stable—has low compression set, high modulus, good tensile strength—is available in a hardness range from 60-90 Shore A durometer. In addition

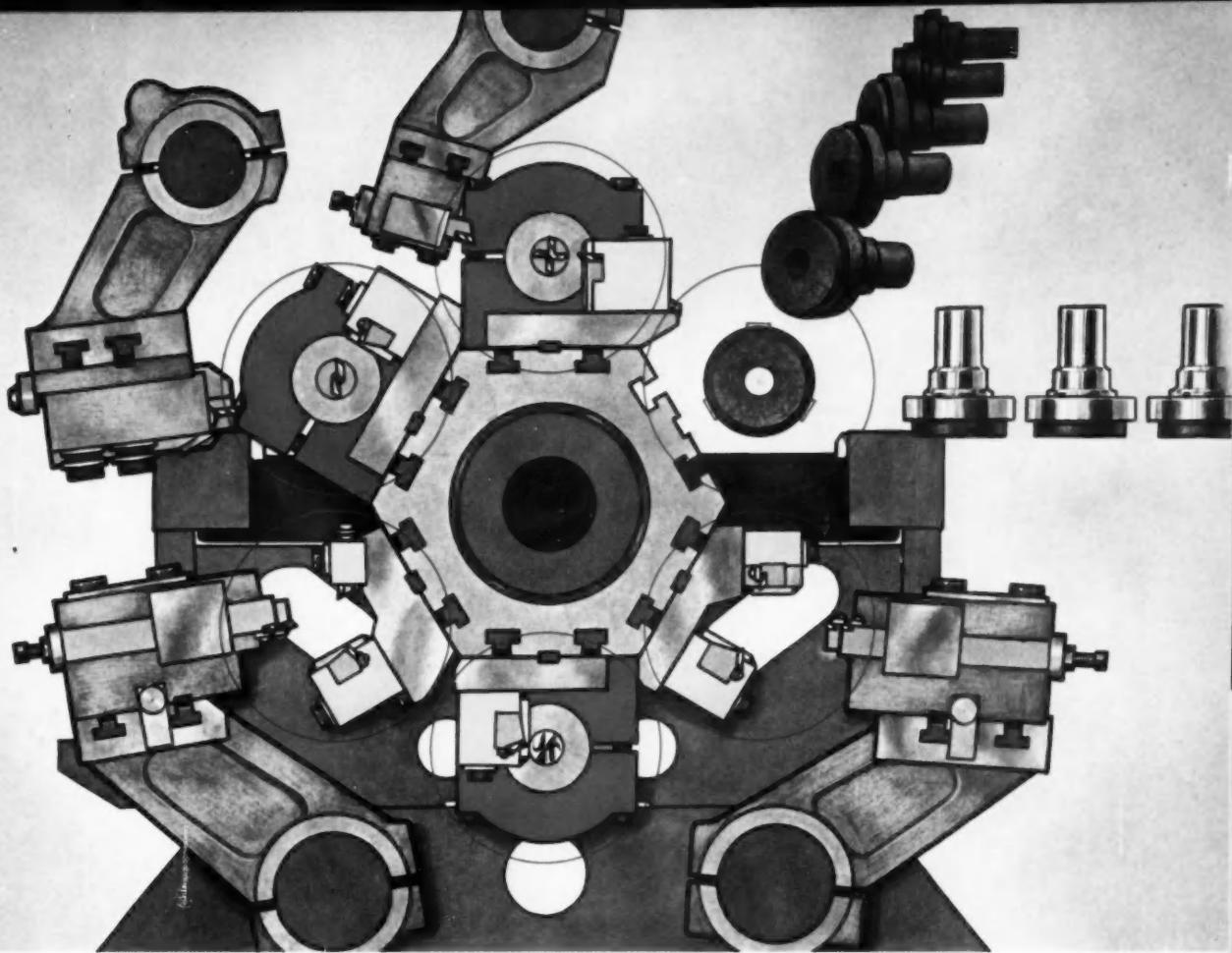
to these mechanical properties, it is also resistant to flame, ozone, age and weather.

VITON, a new versatile design material, is often the only elastomer that will stand up in service when hot fluids are involved. Present and potential uses include valve stem seals, carburetor pump cups, transmission front pump seals, rear axle pinion seals, power steering hose tubes and heat-resistant coated fabrics. Ask your rubber goods supplier about VITON, or write E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Department AI-10, Wilmington 98, Delaware.



SYNTHETIC RUBBER
NEOPRENE HYPALON® VITON® ADIPRENE®

Better Things for Better Living . . . through Chemistry



Open secret of New Britain superiority

Wide-open design makes the most fundamental difference between a New Britain automatic chucking machine and other machines. It speaks for itself as a means of getting at the tooling, making adjustments and clearing chips.

Massiveness, right from the floor up, is equally apparent and equally important in chucker work. You see it in the way the cutting tools make the heaviest cuts with a chatter-free smoothness that can't be duplicated.

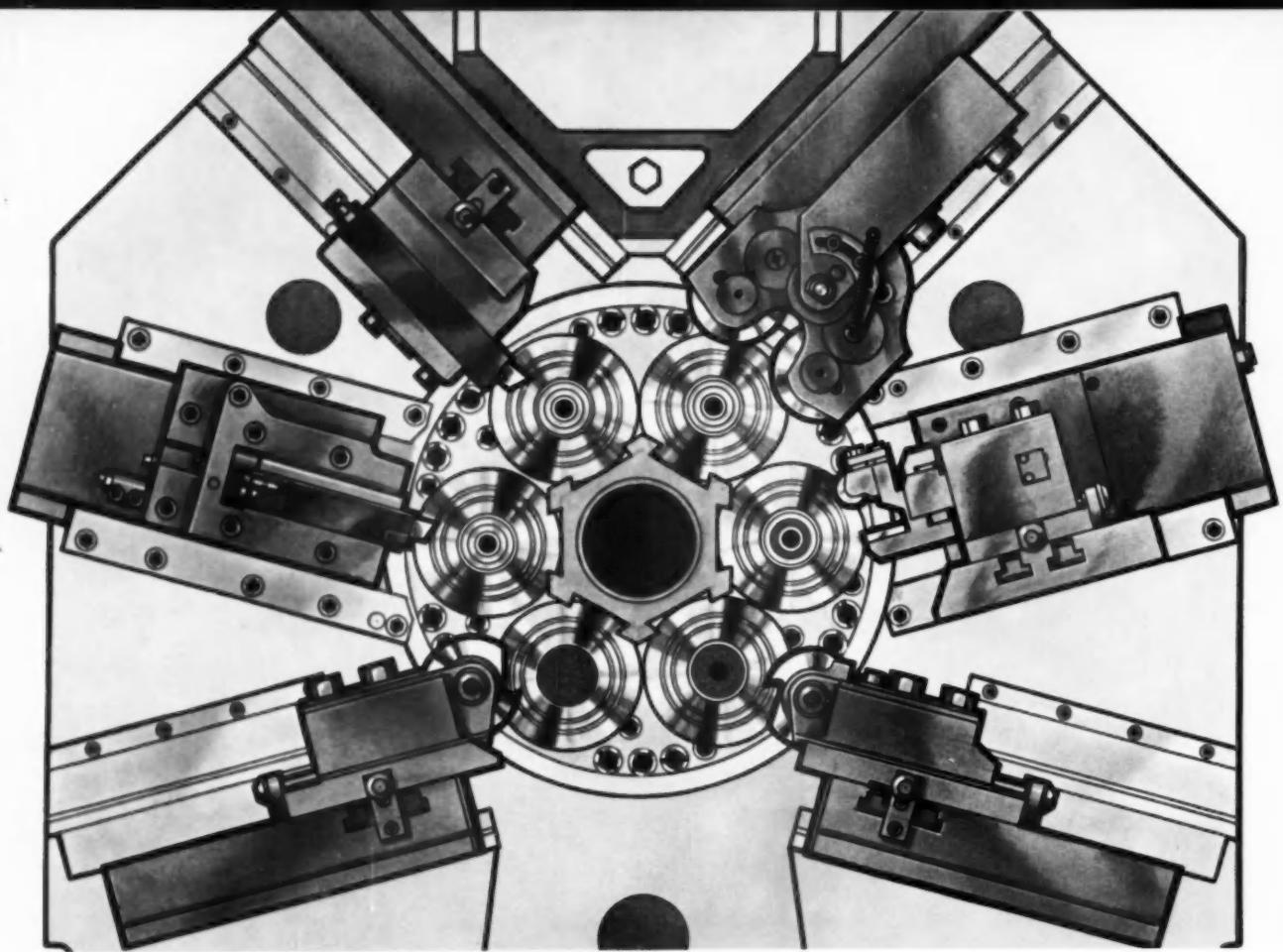
Only New Britain provides a combination of longitudinal with transverse forming motion where needed. This versatility eliminates the need for second operation machines in many cases—particularly when a job is setup for double indexing

for fast two-at-a-time production.

New Britain spares no pains to incorporate every new development to make chucker-type machining more profitable. The open-end design lends itself particularly well to magazine loading and unloading, for example, and many New Britains are being equipped to provide this feature.

Whenever a number of operations are required on cast or forged pieces, these massive, rugged, powerful machines offer great possibilities for savings through faster, more accurate, more reliable production. A new and complete catalog on the New Britain chucker line is just off the press. We would be very glad to send you your copy.

THE NEW BRITAIN MACHINE COMPANY
New Britain-Gridley Machine Division • New Britain, Connecticut



New Britain's answer to a serious threat

Overseas production of just about anything you care to name is making serious inroads on American domestic and foreign markets. It's no secret that European and Asian industry is catching up fast technologically—and they have a real competitive advantage in plenty of low cost skilled labor. While many foreign products are still inferior to those of domestic manufacture, this is far from true in all cases. The answer is, of course, increased productivity at lower cost.

In its all-new line of bar machines, New Britain has developed the most modern bar-turning units available. Five models in two different series are offered with capacities from $1\frac{1}{4}$ " to $5\frac{1}{8}$ ". These machines are designed for really fast, trouble-free, high-precision production. More operations

per machine are possible than ever before. Wide open tool areas allow unlimited combinations of end working and forming tools. New Britains will stay new longer. The exclusive wear-preventing features so familiar to New Britain users have been retained and improved. Catalogs on both the small and large series machines are yours for the asking. After looking this literature over if you think one or more New Britains may help improve your competitive situation, we will be happy to review your prints and arrange a demonstration. No obligation, of course. Call us or call your local representative.

New Britain-Gridley Machine Division, The
New Britain Machine Company, New Britain,
Connecticut.

THE NEW BRITAIN MACHINE COMPANY
New Britain-Gridley Machine Division - New Britain, Connecticut

NEWS

Vol. 123, No. 8

Oct. 15, 1960

Compact Prices Slashed Detroit Fears Standard Cars Will Suffer

By Hugh C. Quinn, Detroit Regional Editor,
and C. B. Campbell, News Editor

A glance at the prices of 1961 automobiles is a tip-off on the kind of competition expected in the compact field. Prices on standard cars remain virtually unchanged from 1960, but compact prices came down en masse.

General Motors did not touch a single price in any of its five standard lines, but Corvair prices were cut \$35 across the board. Plymouth, De Soto, and Dart prices were unchanged, but Valiant prices were reduced as much as \$36.

Ford Juggles Prices

Ford juggled prices in its standard line, adding \$39 to the Fairlane 500 models and \$4 to the Fairlane sedans, but paring \$12 from the Galaxie and Sunliner models. But the Falcon four-door station wagon price was cut \$19, and other Falcon prices remain the same.

Chrysler and Mercury completely realigned their cars, with new lower-priced series appearing at both divisions. Chrysler's Newport series ranges from \$2693 for the four-door sedan to \$3305 for a three-seat station wagon. The New-

port series averages \$202 below comparable 1960 Windsor models. The Windsor, meanwhile, has been boosted \$11.

But the New Yorker series prices were cut from \$241 to \$268.

Mercury brought in two new series, the Meteor 600, beginning at \$2201, and the Meteor 800, beginning at \$2367 for the six-cylinder model. The Meteor 600 four-door sedan, at \$2251, is \$231 below the lowest priced 1960 Mercury four-door sedan.

Mercury dropped its Park Lane and Montclair series, retaining only the Monterey from last year, as well as the station wagons. But

FACELIA SPORTS CAR MAKES U.S. BOW



Just introduced to the U. S. market by Facel Vega S.A. of France, the Facellia sports car seats two or three, comes in a detachable-hardtop model, has a wheelbase of 96½ in. and overall length of 163½ in., and weighs 2180 lb. Maximum speed is given as 114 mph; and base pce New York price as \$3995. Engine is a four-cylinder of 100 cu in. displacement, rated 115 bhp at 6400 rpm. Its features include twin overhead camshafts, five main bearings, hemispherical combustion chambers, and wet cylinder liners.

prices on the Monterey models are up as much as \$158.

Station wagon prices, on the other hand, are trimmed by as much as \$660 for the Colony Park.

What all this means is that the automobile companies are concerned about the compact competition, not only against their own compacts but also against their standard cars.

Different Levels

The four new compacts fit into the picture at different levels. Dodge's Lancer is only slightly higher than the Plymouth Valiant, and just a few dollars more than Comet. Pontiac's Tempest comes in roughly \$100 higher.

But Buick's Special and the Oldsmobile F-85 are another \$200 above Tempest, in a price class all by themselves, with identical prices.

Lark prices were cut across the board, with the lowest-priced model now going for \$1757. Rambler prices were still unannounced at press time, but they were not expected to be changed from 1960.

The accompanying chart compares compact prices for 1961, including the lowest priced four-door sedans, the common denominator in all car lines.

1961 PRICES OF 11 U. S. COMPACTS

MAKE	LOWEST	HIGHEST	4-DOOR SEDAN
Falcon	\$1746	\$2074	\$1803
Comet	1830	2158	1880
Lancer	1832	2257	1889
Valiant	1782	2217	1838
F-85	2175	2425	2175
Special	2175	2425	2175
Tempest	1975	2225	1975
Corvair	1750	2135	1800
Lark	1757	2449	1822
*American	1638	2046	1683
*Rambler	1918	2682	1918

*1960 Prices

300 '61 Cars, Trucks At 43rd Auto Show

What makes the 43rd National Automobile Show in Detroit a *National* show, rather than just a local show like hundreds of others held every year around the Nation?

Here are a few of the facts that support the promotion campaign building this as a national event:

Sponsored by the Automobile Manufacturers Association, meaning every U. S. passenger car maker and every major truck builder. Has full support of the industry

The show features some 300 new passenger cars and trucks—all new models.

First show of the 1961 model year, featuring every new car and truck.

Biggest budget—billed as a \$15 million show.

Largest Exhibition Hall

Largest exhibition hall, with biggest exhibit area. Detroit's new Cobo Hall has more than 400,000 sq ft of exhibit floor space, and AMA is using all of it for the auto show.

National network telecast will bring show to millions of viewers, coast to coast.

Address by President Eisenhower will highlight industry banquet, attended by some 2200 executives, civic and business leaders.

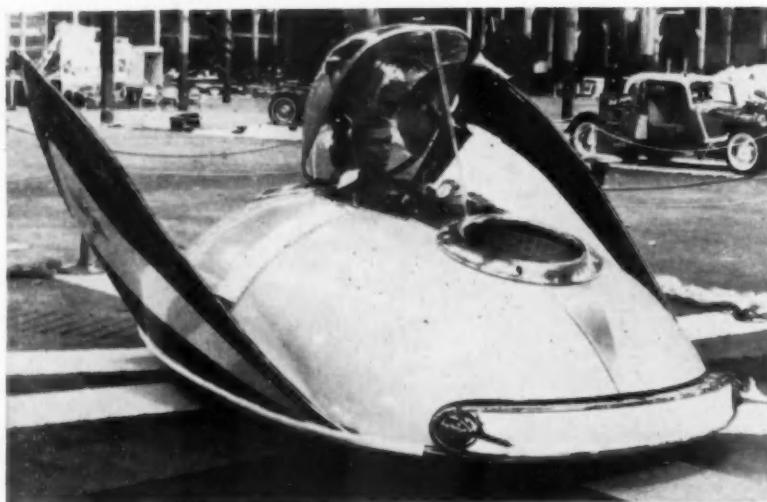
'Auto Wonderland'

Hundreds of automotive suppliers from across the nation participating in "Auto Wonderland," a special exposition featuring the complete story of the design, engineering, testing and manufacturing of an automobile. Also included are American Iron and Steel Institute, Rubber Manufacturers Association, Society of the Plastics Industry, Society of Automotive Engineers, American Petroleum Industry, in addition to suppliers of glass, steel, power, paints, chemicals, electrical accessories, and countless other parts and components.

A commemorative stamp, issued by the Post Office Department, features the "Wheels of Freedom" theme of the National Auto Show.

Press coverage, both by magazines and daily newspapers, is most complete coverage given any auto show, anywhere.

'CAR OF TOMORROW' HAS 'GLAMOUR' PAINT



Air-supported vehicle designed by George Barris, of Los Angeles, was awarded first prize in National Champion Custom Car Show in Detroit. Two DC-current fans enable car to travel eight or 10 in. off ground. Futuristic effect was added to car by Metalflake finish developed by Dobeckmun Co.

Top Chrysler Aides Cleared by Inquiry

Investigators have cleared, after a "thorough and searching" inquiry, all 36 Chrysler Corp. top executives of conflicts of interest.

Special counsel and accountants found there was no basis for conflict of interest charges after probing executives, their families and close relatives over the last 10 years.

The inquiry resulted from stockholders' charges of waste, mismanagement and corruption.

William C. Newberg, then president of Chrysler, was compelled to resign after disclosure he had made more than \$450,000 from his interests in two outside suppliers. He agreed to turn over the profits from the suppliers.

Two weeks ago, Jack W. Minor, marketing director for the Plymouth-De Soto-Valiant Div., resigned on request. It was claimed he had interests in advertising firms doing business with Chrysler and had made \$20,000 in commissions.

Seagrave Plans 'Custom' Compact

A maker of fire engines for 100 years, Seagrave Corp. has announced plans to enter the automobile field with a passenger car in the Volkswagen-size class.

Leslie Roberts, Seagrave chairman, said the car will have a 94-in. wheelbase, the same as Volkswagen, and will sell for less than \$3000. He said the chassis and body would be "hand crafted." The engine will be made by Continental Motor Co. The new model, to be called the Seagrave, will be available in three models — station wagon, two-door coupe, and two-door sedan. Buyers would have a choice of four, six or eight-cylinder engines.

Mr. Roberts said styling would remain comparatively unchanged from year to year and that no more than 25,000 models would be produced yearly.

Mr. Roberts said prototypes and design rights were purchased from

a Detroit corporation. He said the transaction involved a deferred payment of stock of the Seagrave subsidiary which will manufacture the new car.

Rootes Announces Smaller Car for '62

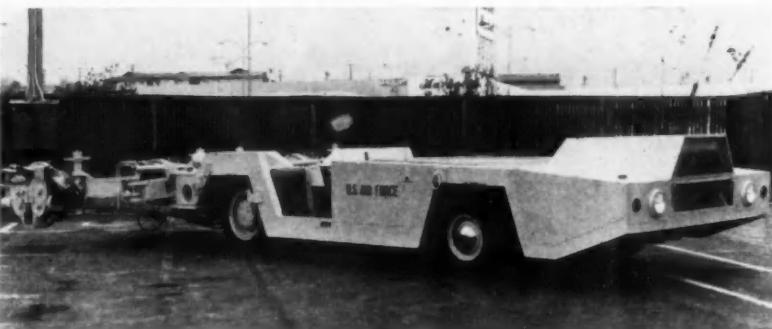
Its sales hard hit by the U. S. compacts, the Rootes Group, British auto maker, announced it will have a smaller car in 1962.

In London, Lord Rootes, chairman, announced his company will build a \$62 million plant near Glasgow, Scotland. It will be capable of turning out 3000 new cars a week. About 25 per cent of this production will go to the U. S.

Lord Rootes would reveal no details of the new car after saying it would be smaller than the Hillman, which has a 96-in. wheelbase.

Hillman's problems in this country stem from prices which start at about \$2000, thus putting it in direct competition with Detroit compacts. Hillman registrations through the first six months this year were 7800. Last year, in the same period, there were 17,000 registrations.

SNOW DRIVER FOR B-52 BOMBER



Moving B-52s over rutted snow and ice has been solved by Air Logistics Corp., Pasadena, Calif., with its "hydraulic wheel unit." The unit is locked to bombers wheels by a complicated lobster-like mechanism. By applying torsional power to wheels, it can move 500,000 lb. It is powered by 270 hp Ford industrial engine.

NEWS

CONTINUED

Tiny Ford Compact Appears Assured

Detroit observers feel confident that Ford Motor Co. will produce a four-passenger automobile smaller than the compact Falcon, but so far there has been no official word from the company's Dearborn headquarters.

Closest thing to a positive acknowledgement came from J. O. Wright, general manager of Ford Div. and vice president of Ford Motor Co. at Ford's 1961 press preview in Flora, Ill. Mr. Wright admitted that Ford was studying the situation.

This in itself is not a revelation, but Mr. Wright went a step further. He explained that the market for "economy imports" is around 450,000 cars, and if domestic compacts do not seem to put a dent in this market, then there is no alternative but to bring out a smaller car that will.

Ford recently issued a complex statement on its engineering relations with Ford of England and Ford of Germany. The announcement, mostly a historical description of the cooperation between Dearborn and the two foreign subsidiaries, said a new car was being prepared for Germany. But it said nothing about such a car for the U. S.

The little Ford, probably to be called Cardinal, is to be built partly in Germany.

Auto Registrations To Top 73 Million

Motor vehicle registrations are expected to total 73,868,000 for 1960, a gain of 2,371,000 or 3.3 per cent over the 71,497,000 registrations in 1959. The 1960 estimate,

prepared by the Bureau of Public Roads, U. S. Department of Commerce, is based on reports of State registration agencies.

Passenger cars are expected to total 61,569,000 for 1960, a 3.4 per cent increase. Trucks and buses are expected to number 12,299,000 a gain of three per cent.

California again leads with expected registration of 7.8 million. New York is second with 5.1 million. Texas, Pennsylvania and Ohio will each have more than four million. Illinois and Michigan will have over three million and New Jersey, Florida and Indiana will have more than two million each.

GM Gives \$480,000 For Driver Training

More than \$480,000 was contributed by General Motors toward the driver education program in the nation's schools during the 1959-60 school year, GM President John F. Gordon has announced.

Under GM's driver training assistance plan, dealers are given an allowance for each new automobile loaned to schools for driver training. This allowance helps dealers defray vehicle maintenance and reconditioning costs.

GM dealers representing Chevrolet, Pontiac, Oldsmobile and Buick Divs. loaned 3800 new cars to high schools over the country during the 1959-60 school year, Mr. Gordon said.

Since GM pioneered the allowance plan in 1955 the company's contributions to dealers total more than \$2,700,000.

NEW SIDE-UNLOADING ALUMINUM DUMP TRUCK



Dumping clear of roadway, all-aluminum truck by Differential Co., discharges load at 55 degree dumping angle. Single stroke hoist cylinders have small diameter long stroke and are cushioned at top of stroke to eliminate shock.



PERFECT CIRCLE
PISTON RINGS ARE BUILT
TO TAKE IT

25 TIMES MORE CHROME

The solid chrome on Perfect Circle 2-in-1 rings is 25 times thicker than the chrome plating on an automobile bumper.

This thicker chrome means thousands of extra miles of full power and oil control. And, PC rings go through a special lapping process that virtually eliminates tedious break-in.

Whatever the service, Perfect Circle rings are built to take it. Always specify Perfect Circles—preferred for original equipment and replacement everywhere.



PERFECT  **CIRCLE**

PISTON RINGS • PRECISION CASTINGS • POWER SERVICE PRODUCTS • SPEEDOSTAT

HAGERSTOWN, INDIANA • DON MILLS, ONTARIO, CANADA
Circle 128 on Inquiry Card for more data

Quantity
PRODUCTION
of
GREY IRON CASTINGS

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY
FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE

Aetna

BEARINGS

Aetna Packaged Bearing Units

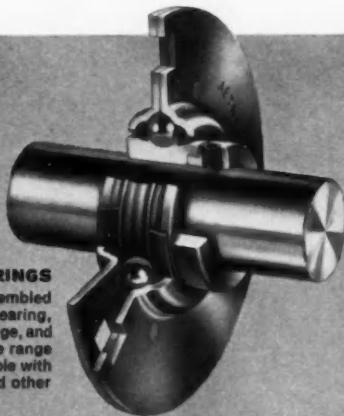
REDUCE COSTS...

STEP UP PRODUCTION

Low-cost Aetna packaged bearing units simplify modern assembly line production. Designed as complete, integral, prelubricated units, these bearings greatly reduce over-all assembly costs and assembly time, and minimize stock handling. Individual units are simple in design, incorporating a single row of radial ball bearings with extra large

lubricant capacity and a highly efficient seal. For all light-duty, medium speed applications, they assure dependable product performance free from troublesome servicing.

For complete information, call your Aetna representative listed in your telephone directory, or write for Prelubricated Bearing Catalog AG-59.



ADAPTER BEARINGS
Complete—pre-assembled with self-aligning bearing, seals, mounting flange, and locking collar. Wide range of sizes. Also available with extended inner and other configurations.



SPROCKET IDLERS
Compact—easy to install. Effectively sealed against dirt and grime. Available in a wide range of sprocket sizes and configurations to accommodate all standard chain drive equipment.



BELT IDLERS
For tighteners and direction changers. Available for all standard flat belts and V-belts. Permanently lubricated and sealed against dirt and grime.



SPROCKET IDLER—DETACHABLE CHAIN
Typical of other package units available for multiple applications.



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ANTI-FRICTION SUPPLIERS TO LEADING ORIGINAL EQUIPMENT MANUFACTURERS SINCE 1916

1907 . . . A LETTER OF SATISFACTION
FROM AN EARLY HOLLEY CUSTOMER . . .

June 24, 1907

Holley Bros.
Detroit, Mich.

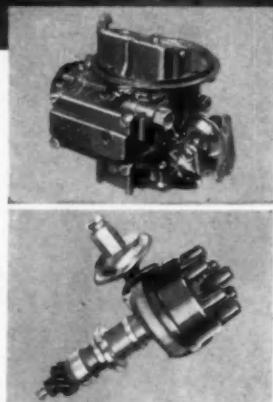
Gentlemen:

Our six-cylinder car which won the 24 hour race Saturday, breaking all world's records, was equipped with the Holley Magneto. During the entire race it gave no trouble of any nature and we obtained uniformly satisfactory results.

"Our six-cylinder car which won the 24 hour race, was equipped with the Holley Magneto... it gave no trouble..."



Even back in 1907, when the horseless carriage was sometimes balky and unpredictable, Holley equipment was earning a reputation for stamina and dependability. Through continuing research and creative engineering, Holley has contributed to the development of the precise and intricate carburetion and ignition equipment required for today's automobiles. That's why Holley Carburetors are *original equipment* in 1961 on so many popular makes of cars—including compacts.



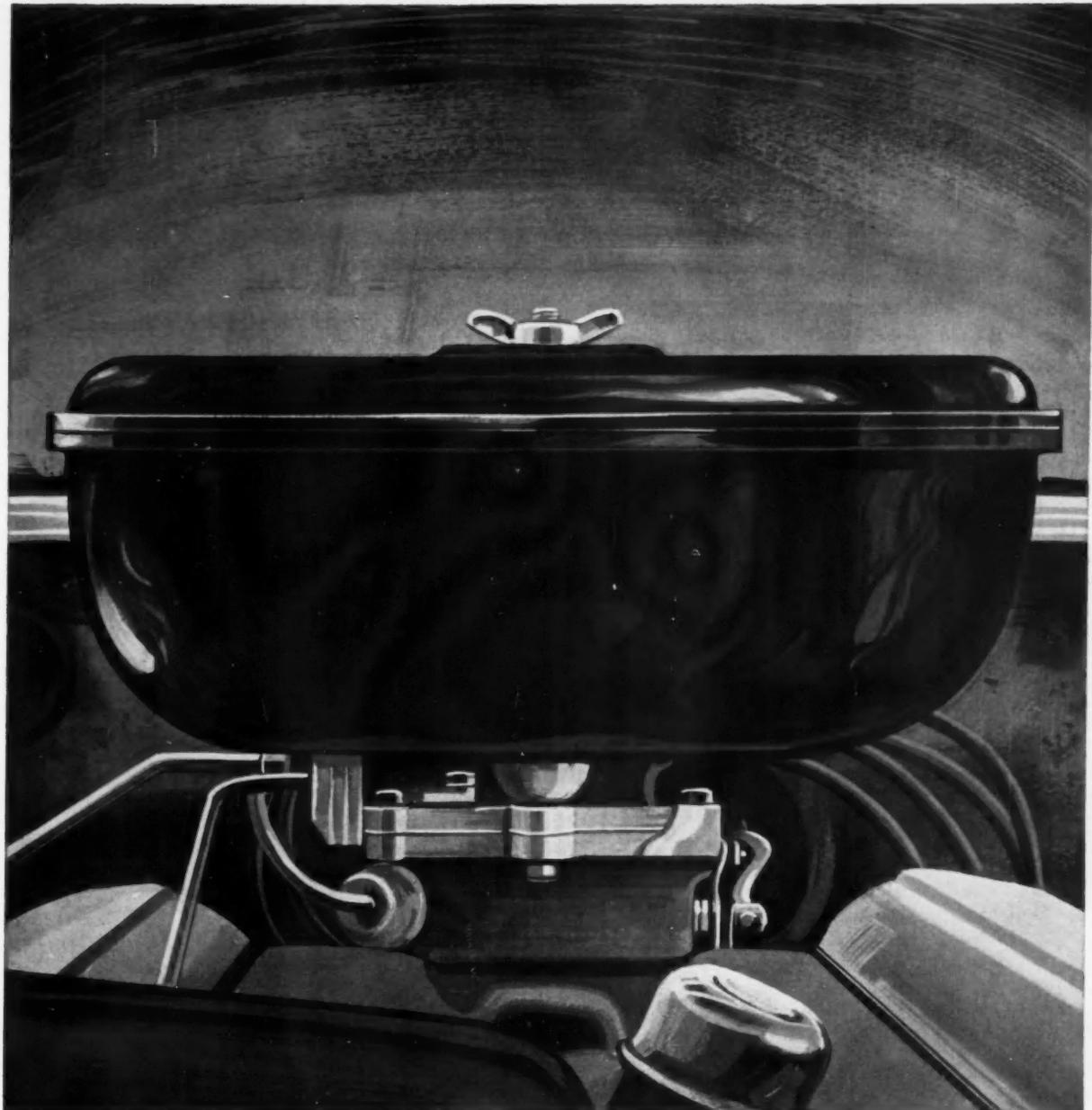
Holley Carburetors and Ignition Equipment maintain the Holley reputation for quality and dependable performance.



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I-32

ORIGINAL EQUIPMENT MANUFACTURERS FOR OVER 55 YEARS



THE NEW PHENOLICS

Let your ideas for tomorrow take shape in a host of hard-working materials • When you're getting ready to break with tradition, take a look first at the *new* phenolics.

Then lift the hood. You'll find a lot of places where you can put today's phenolics to work.

They're huskier; impact strength is up—as high as 15 ft-lb. per inch. They resist heat as high as 500°F. Electrical properties, always good, are still better now—and improving all the time.

Idea: Did you know you can get Durez phenolics designed specifically for wet-on-one-side, dry-on-the-other situations? Think what that might mean in terms of *noncorroding hose connectors*.

Idea: How about a low-cost *distributor bowl case* of medium-impact phenolic? A nonrusting enclosure for accessory motors? A phenolic *air cleaner bowl* that hushes rattle and vibratory hum?

Idea: Or consider what you could do with a Durez glass-filled phenolic that outlasts metal in *oil-pump gears* and *automatic transmission parts*.

Remember, too, that when you design with phenolics you almost always save money. They can save you the whole cost of machining and finishing a part. They're low in price, stable in price, always available.

These newer, harder-working materials come from Durez in hundreds of formulations—give you a variety and a versatility that let you dream a little. To put the touch of tomorrow in today's design, come to Durez for *plastics that take you where other plastics can't go*.

For descriptive Bulletin D400 or for help on a specific application, write us.

DUREZ PLASTICS DIVISION

8209 Walck Road, North Tonawanda, New York

HOOKER CHEMICAL CORPORATION



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How SHAKEPROOF Protects Your Product's Reputation

Here is the answer to one of industry's toughest problems . . . how to reduce costly inspection rejects and avoid customer complaints due to fastening failure.

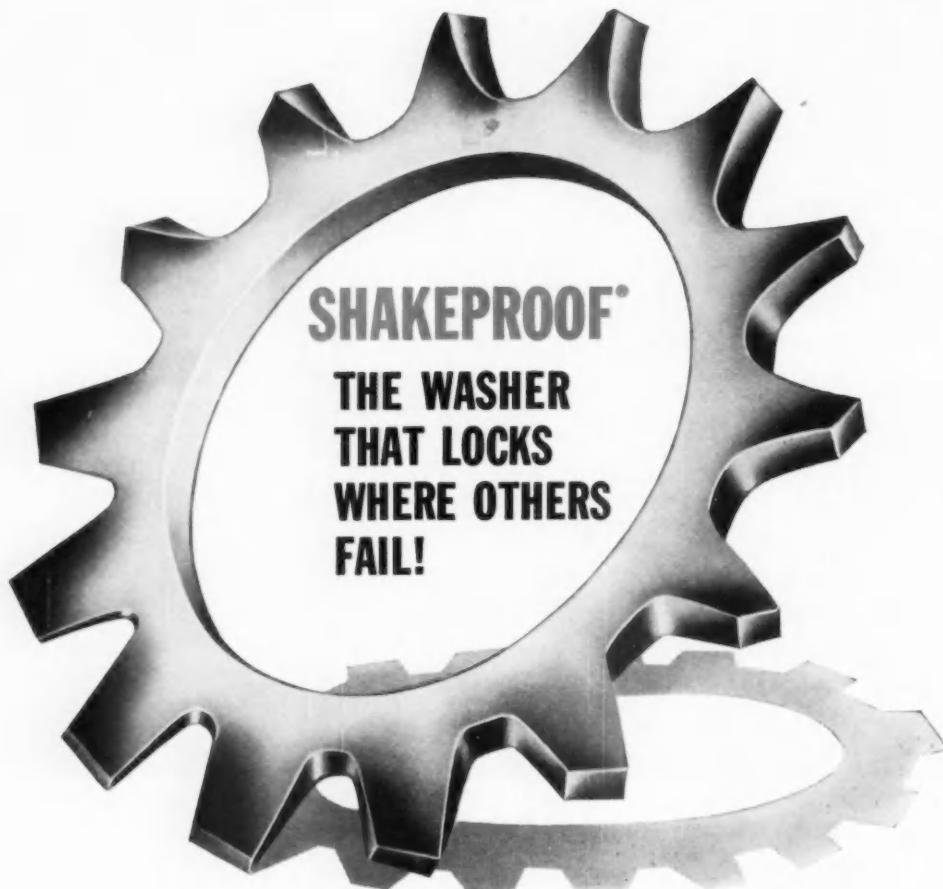
Shakeproof engineers have gathered formidable evidence that only one washer locks . . . where others fail! Their findings, just published in the booklet offered at the right, prove that "weight and thickness" don't lock a fastener, and that "spring action" alone isn't locking action.

They have conducted tests with various types of washers commonly used for protection against failure caused by handling and operational vibration. Results show that only

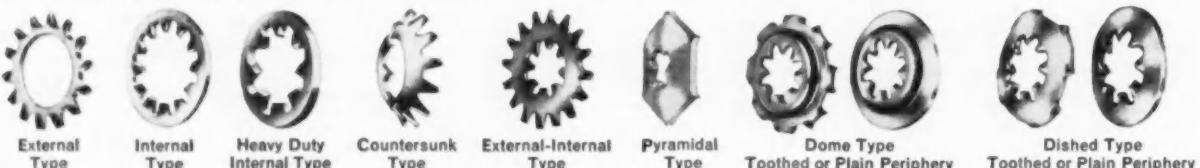
Shakeproof Lock Washers retained 100% relative locking efficiency.

Be sure to protect your product's performance and reputation with the one top-quality, top-performance lock washer . . . Specify SHAKEPROOF . . . the original toothed lock washer!

Send for this Free Booklet Today—it is filled with factual test data and actual case histories which show how you can be sure of quality at every step in the assembly of your product.



STANDARD SHAKEPROOF LOCK WASHERS INCLUDE:



SHAKEPROOF "Fastening Headquarters"®

DIVISION OF ILLINOIS TOOL WORKS

St. Charles Road, Elgin, Illinois

In Canada: SHAKEPROOF/FASTEX Division of Canada Illinois Tools Limited, 67 Scarsdale Road, Don Mills, Ontario

LOOK TO SHAKEPROOF—THE LEADER IN FASTENING

NEWS

FEATURES

Mercury Challenges Big 4 on Size, Price

The big news at Lincoln-Mercury Div. in 1961 may not be the new cars at all, although both Mercury and Lincoln-Continental are completely changed. The real story might turn out to be the change in marketing approach and product concept, rather than styling and engineering.

The division took one bold step in dropping Mercury, traditionally a big, medium-priced car, down into the Ford-Chevrolet-Plymouth-Dart size and price class. And it took a second big step in paring the prestige Lincoln down to a single basic model, the new Lincoln-Continental.

L-M's venture with the Mercury Meteor 600 and 800 series parallels Dodge's move last year with the

Dart. If Mercury has the same success with the Meteor series as Dodge has had with Dart, the division is in for a good year. Mercury sales in 1960 were down slightly from 1959.

Mercury's First Six

Further strengthening Mercury's new market position is the six-cylinder engine in the Meteor 600, first six ever offered on a Mercury.

Ben D. Mills, division general manager, sees the overall car market split into four segments; basic transportation, compact cars, conventional regular-sized cars, and luxury cars. L-M has an entry in each segment with the imported Anglia, compact Comet, the Mercury and Lincoln-Continental.

Actually, this re-positioning of Mercury does not mean that Mercury has abandoned its traditional

position in the medium size and price category. Introduction of 10 compact cars to the American scene merely has pushed the historical "low-priced three" up into a higher bracket, in relation to the overall market.

Middle of Scale

Mercury has cut its size and its price, but it still is somewhere around the middle of the scale, where it always has been. But its size and its price are more realistic than they were in preceding years. Mr. Mills believes his division and his dealers are in a stronger position to make money with this new arrangement, because they can offer a car in each of the four market segments. He expects sales for the division will increase a minimum of 25 per cent over the last half of the 1960 model year, when Comet was on the market. The big boost, of course, is expected to come from the two Meteor series.

L-M, incidentally, will not import the German-built Taunus in 1961.

VAUXHALL VICTOR REDESIGNED



Latest General Motors-built model features 18 per cent larger rear window, ribbed rear panel and redesigned instrument panel. The 92-cu in. 55 hp engine has new steel shell big-end bearings for sustained high speed.

GM Motorama Opens Nov. 3 in New York

General Motors will revive its Motorama product showcase Nov. 3 at the Waldorf-Astoria in New York. After a seven-day run in New York, Motorama will move to San Francisco Jan. 7-15 and Los Angeles Jan. 28-Feb. 5. The exposition will feature displays of all lines of GM passenger cars, Chevrolet and GMC trucks, as well as appliances and accessories produced by other GM divisions.

AI TABLOID

Nine research reports on legibility factors, photic stimulation, decision behavior, perceptual isolation and other human engineering subjects have been released by the Office of Technical Services, Business and Defense Services Administration, U. S. Dept. of Commerce.

A new process to produce carbon disulfide from petroleum feedstocks has been developed by Taylor Fibre Co. The process reportedly offers 25 per cent less plant investment and 15 per cent lower operating costs than processes based on methane.

Ductile iron, because of its resistance to shock at low temperatures, is being employed for components of equipment used in the Arctic and Antarctic regions.

Japanese output of electronic products in the first quarter of this year totaled \$282.1 million, up 53 per cent from the same 1959 period. A compilation of data reveals Japan's electronics output was running at an annual adjusted rate of \$1.4 billion, compared with \$936 million of production for 1959.

Engineers are investigating radio communications problems involved in landing an unmanned space craft on the moon. They are studying the best approaches to be used in providing en route and terminal radio communication facilities such as tracking, ranging, encoding and transmission of the scientific data.

Fine wire from nickel chromium and cobalt chromium alloy appears the most immediately suitable of a number of materials studied for the manufacture of high-temperature fabrics for re-entry parachutes in manned satellites.

Goodyear Tire & Rubber Co. engineers report the United States now has more than 2000 mi. of rubberized asphalt highways.

A mathematical approach used to obtain general design information on a space vehicle carrying sensitive cargo is explained, and equations used in calculating the positions of earth satellites are described in two reports of Air Force-sponsored research. A third report concerns the effects of missile trajectory resulting from small changes in burnout position and velocity.

To make the jet engine practical, it was necessary to develop nickel-containing materials capable of carrying high loads at unusually high temperatures.

Results of a survey to facilitate prompt use of newly developed high temperature ceramic tubes and components in aviation electronic equipment are reported in an Air Force "phasing-in" study. Also available are four other research reports on ceramics.

Twenty-eight studies for the Atomic Energy Commission in the fields of metallurgy and ceramics have been released to the public.

A mathematical study of the theory of turbulence, and an annotated bibliography on aerodynamics, prepared for the Air Force, have been released to science and industry.

The synthesis and purification of dielectric materials for use as electrical insulation at high temperatures are described in a research report. Also available are two reports on electrical and electromagnetic properties of radomes, and a report on the cell-vacancy theory of liquids.

An improved method of bending plastic pipe, requiring less than a tenth of the time normally taken, is one of 70 techniques and devices recommended by the Navy's Bureau of Ships for saving time and money in machine shop and other industrial operations.



The 1960 annual Doehler Award, highest honor of the die casting industry, has been won by E. V. Blackmun, Aluminum Co. of America, for outstanding contributions to die casting advancement.

Chesebrough Sees Improved Quality

The quality control man is the key to superior products Harry E. Chesebrough, general manager of Plymouth-De Soto-Valiant Div. of Chrysler Corp., told members of the Greater Detroit Section of the American Society for Quality Control.

"The car of the future—by that I mean the car of this decade—must be a real quality automobile," he said.

"We will see new, stronger, lightweight alloys which will go into its construction, and the car will be engineered for better quality.

"There will be a better understanding of the quality objectives, and the quality control man will be a key member of the team which works out the product design, the tooling and the manufacturing layout to produce the car."

Electronic Scanning Pulse Master Minds Chrysler's Twinsburg Plant Welding Line

An electronic scanning pulse traveling from one machine to another at a rate of 120 millionths of a second is master minding the welding operations at the Chrysler Corp.'s giant stamping plant at Twinsburg, O.

It is an electronic scanner—the only one of its kind in the world—and it automatically searches, controls, regulates, times and keeps a record on the largest automatic welding assembly line in the automotive industry.

It is called the "Magic Wand" and it insures that all unit bodies be solid, metal-fused integral units.

This electronic brain scans 24 electrical welding units at an almost unbelievable speed — 320 times every second it asks each welding machine: "Are you ready to weld?"

When it gets the okay signal, it permits individual firing of the 24 units so fast that the human eye cannot detect the intervals. In this way, more than 860 spot welds are created to form the rails and the floor pan assembly of almost all the corporation cars.

The "Magic Wand" is a necessary adjunct to the automated assembly line because the welding

operations require such tremendous amounts of electrical power that two giant welders fired simultaneously would seriously affect weld quality due to excessive voltage drop.

This electronic brain controls the firing in millisecond intervals to all the machines and no two fire at the same time. It directs the use of 90,000 kilovolt amperes of energy, which is the electrical demand of all 24 machines. This is equal to 45,000,000 watts of electricity.

Some React Quicker

There is always a certain amount of inherent slowness in an automated assembly line and certain machines react quicker than others. But the Magic Wand is an impatient scanner. If a given machine fails to fire and send in a "finish" signal within a three-second interval, the scanner turns on a red warning light and moves on to fire other welding machines. If any portion of the automated line cannot be repaired in a few minutes, the entire assembly operation is shifted to a duplicate assembly line with the same number of welding machines and the same electronic brain to command it.

Manufacturing engineers point out that use of the electronic scanner makes sure that every welding machine receives the same charge of electricity each time it welds, thereby assuring consistent quality in the welding operation.

To make all this run smoothly, the Chrysler Corp. owns and operates its own outdoor sub-station which steps power down from 132,000 volts to 13,200 volts for distribution through tunnels to various sub-stations throughout the ultra-modern plant.

VETERAN S-P OFFICIALS HONORED



Forty years of service by E. J. Hardig (center), Studebaker-Packard Corp. chief engineer, are recognized with gold pin from H. E. Churchill (right), S-P head. A. J. Porta (left), executive vice president, got 35-year pin.

EUROPEAN ROUND-UP

By DAVID SCOTT • Special Correspondent

An Anglo-Italian application of photogrammetry is claimed to produce highly accurate drawings of a car or its integral components directly from a scale model.

Developed by Leland Instruments and its associate, Officine-Galileo, the system is based on stereo-photography such as is used for aerial map-making, combined with a rapid method of converting the three-dimensional image into contour plotting for a plane representation of a solid object.

Laycock Engineering has produced a clutch employing a circular diaphragm spring in place of the conventional coil springs. Advantages listed are low pedal pressure required for disengagement, constant spring characteristics throughout the life of the unit, and reduced number of working parts.

Cranes (Dereham) Ltd. has introduced a new air-mechanical disk brake intended for heavy trailers. The 18- by 1 1/4-in. disk is keyed to the wheel hub by 12 sliding dowels, this arrangement simplifying alignment and limiting heat transference to the hub.

A 30-psi air cylinder actuates the brake pads through a screw and lever mechanism with 10 times multiplication. Braking is fade-free, and retardation is stated to be twice that obtained by 15- by 7-in. drums on a trailer of equal weight.

After a 10-year absence, Lea Francis is re-entering the British auto scene with a new car which was exhibited at the London Motor Show. Named the Lynx, it is a two-seat sports model in the upper-bracket price range.

Two German engineers recently demonstrated a device claimed to reduce the carbon monoxide content of exhaust gas by 60 per cent and to improve fuel consumption by 10 per cent. Details of the unit have not been disclosed, but it is known to fit between the carburetor and intake manifold where it is said to eliminate vaporization turbulence by fully atomizing the center core of each fuel droplet.

In France, Simca has introduced a five-bearing crankshaft for improved versions of its two four-cylinder engines, now known as the Rush. Compressions of both are raised, and at 7.4 to 1 the 65.5-cu in. one develops 42 hp at 4900 rpm. The 78.7-cu in. Rush with a 7.5 ratio puts out 52 hp at 4900, and the Rush Super with 8.5 delivers 62 hp at 5200.

The new crankshaft features a centrifugal oil filter combined with the front pulley, made under Fiat license. Oil is fed in from the main gallery in the cylinder block, is spun through an internal element, then fed through the center to the main and big-end bearings. The cover is removable for cleaning at 12,000-mi intervals, and no other filter is used.

International links among Europe's automotive firms are building up. Innocenti in Milan, maker of Lambretta scooters, has started assembly of some British Motor Corp. cars, and the Austin A40 and Austin-Healey Sprite will be available on the Italian market in November, thereby coming inside the Common Market tariff wall which discriminates against direct exports from the United Kingdom.

B.M.C. has formed a subsidiary company in Sweden, controlled from Stockholm and Malmo. The corporation's sales to that country have sagged this year, and it aims to boost them by streamlining the importation, distribution and service of its complete range of cars and trucks.

Wilmot Breeden, British manufacturer of auto components, is extending its activities in France by expanding its local production facilities with Compagnie Industrielle Mecanique and Autocoussin, in both of which it has sizable financial interests.

Moves Into Brazil

Finland's Valmet Metal Works has formed a Brazilian company to produce its Diesel tractor for the local market. Situated in Mogi das Cruz, near Sao Paulo, it will have an annual capacity of 3000 by 1962. Valmet exported 1200 tractors to Brazil last year, but since then Brazil has banned imports to stimulate native industry.

Joseph Lucas has forged another U. S. link by tying up Rotax with the Garrett Corp. of Los Angeles to create Rotax-Garrett. Field of activity is aircraft and missile equipment, and the reciprocal arrangement will enable the two companies to produce and market each other's products in their respective countries.

Vickers-Racine Pact

Similarly, Vickers-Armstrong (Engineers) Ltd. has reached an agreement with Racine Hydraulics & Machinery to develop their hydraulic interests jointly, and to sell their equipment on a global basis. The field covers machine tools, presses and mechanical handling.

Declining sales of imported cars in the U. S. have hit French exports, which are now well below their February peak. Meanwhile, the demand at home has not grown in step with increased production. One reason is the exorbitant gasoline tax, which makes French fuel cost 91 cents a gallon—the highest in Europe. As a result, Renault—geared up to 2000 Dauphines a week—has had to reduce the work week of half its staff from 48 to 45 hours.

NEWS

FEATURES

CONTINUED

Rambler Expands Overseas Market

With more compacts infringing on Rambler's once-exclusive domestic market, American Motors is expanding its market overseas. Latest production agreement is in Australia, where Australian Motor Industries, Ltd., of Port Melbourne will begin assembling Ramblers in January.

The Australian firm is AMC's fourth overseas licensee. Cars already are being assembled in Mexico and South Africa, and a plant in Malta will begin operations in December.

William S. Pickett, Director of Automotive Export for American Motors, reports that negotiations are under way for production in England, Iran, Belgium, New Zealand, Colombia and Uruguay.

Australian Motor Industries will receive major components from Kenosha, Wis., with other parts produced locally. The firm, only independent auto maker in Australia, has been in business since 1930 and has 3000 employees. Production capacity is 25,000 units annually, and could go to 40,000 cars on a two-shift basis. The plant has 12 acres of manufacturing floor space.

The company now handles Standard-Triumph, Daimler-Benz and DKW passenger cars and Fiat farm and industrial equipment.

W. J. Balchin, managing director of Australian Motor Industries, said he expects Rambler to account for about 10 per cent of industry sales in its price class the first year.

Rambler export sales are running 27 per cent ahead of last year, and Mr. Pickett anticipates a further 30 per cent increase in 1961.

WHITE HOSTLER IS NEW FOR 1961



Compact cab-over-engine model has 74-in. wheelbase for tractor and 114-150 in. for truck. Cab tilt is controlled by torsion bar to reduce maintenance expense. Other features include low steps, wide doors, full visibility.

33 Pct. Rise Likely In Business Aircraft

An authority on jet engines has predicted a substantial increase in business aircraft sales which, he says, by 1970 will show a 33 per cent increase over current production.

J. N. Krebs, an engine project manager in General Electric's Small Aircraft Engine Dept., said that market studies show the beginning of a strong upward surge in demand for small and intermediate size aircraft. Business aircraft sales as a result, he said, are expected to increase from last

year's 8000 to 12,000 units a year by 1970.

Addressing delegates to the annual convention of the National Business Aircraft Association in Los Angeles, Mr. Krebs pointed to gas turbine engines as an important factor in the changing market.

"In 1959 there was only one U. S. gas turbine-powered business aircraft in production," he said. "In contrast, by the end of next year all business aircraft and helicopters in the 15,000-lb class and up will be turbine powered."

By 1970, he added, at least 40 per cent of all business aircraft will be powered by gas turbines.



**This
is
the birth
of a Burton coil spring**

Here is the exact moment when a rod of steel becomes a Burton Coil Spring. This is the moment when the sum total of years of experience, engineering know-how, quality control and scientific operation of the latest and most modern manufacturing equipment all combine to produce quality.

Rugged, tough, most years of service... that's a Burton Coil Spring or a Burton Leaf Spring. Millions in use on every type of moving vehicle. Dependable performance results from exacting specifications and proper controls we maintain throughout the manufacturing processes.

• •

The engineering ideas are born here

On the drawing board... out in the shop... experienced minds at Burton are concentrating on the problems of automobile and truck springs. We can help you solve your problem of more payload and less weight. Call on us. 37 years of knowing-how.



BURTON Auto Spring Corporation
WESTERN AVENUE AT 48TH STREET • CHICAGO 32, ILLINOIS

Since 1923 we have manufactured automotive springs exclusively

MENT

IN THE NEWS



A. O. Smith Corp., Industrial Products Group—James F. Jones has been promoted to group executive.



Timken Roller Bearing Co.—Wells E. Ellis has been appointed assistant chief engineer at Canton, O., laboratory.



Huck Mfg. Co.—Leo F. Brown has been named vice president-manufacturing.



Oakite Products, Inc.—Automotive Div.—John B. Holland has been appointed manager.



Parker Rust Proof Co.—William G. Dowsley named staff assistant to the president.



E. W. Bliss Co.—Richard E. Rassel has been named manager of automotive press sales.

B. F. Goodrich Co.—Dr. Richard G. Bauman has been appointed manager of tire research.

General Motors Corp., Defense Systems Div.—Dr. David S. Potter has been appointed head of sea operations department.

U. S. Steel Corp.—Charles R. Pearce, Jr. has been promoted to commercial manager of forged products.

Goodyear Tire & Rubber Co.—Peter Macdonald has been named general manager of the Washington office.

Tidewater Oil Co.—Charles J. Melendeck has been promoted to manager of eastern marine department.

Huck Mfg. Co.—William A. Garrett has been appointed purchasing director.

Dura Corp., Weaver Mfg. Div.—Albert W. Ray, Jr., has been appointed administrative assistant to the vice president in charge of sales.

General Motors Corp., Allison Div.—K. H. Hoffman has been promoted to administrative assistant to the general manager.

Thompson Ramo Wooldridge, Inc., Thompson Products Piston Ring Div.—Norman Larson has been promoted to manager-original equipment sales.

Oakite Products, Inc.—Peter J. Kornett, general manager of manufacturing, has been elected to the board of directors.

General Motors Corp., Hyatt Bearings Div.—E. P. O'Neill has been promoted to assistant general sales manager.

B. F. Goodrich Co.—John B. Hunter, Jr. has been named advertising manager.

Norma-Hoffmann Bearings Corp.—Paul Nowak and John R. Ciupak have been named sales engineers in the Detroit office.

Allis-Chalmers Mfg. Co.—H. T. Larmore has been promoted to general products manager of the construction machinery division.

Timken Roller Bearing Co., International Div.—Walter H. Shealar has been promoted to assistant sales director.

Mack Trucks, Inc.—Joseph J. McGuire has been promoted to factory manager at the W. Front St., Plainfield, N. J., plant.

General Motors Corp., Manufacturing Staff—Paul A. Switzer has been promoted to director-planning and schedules section.

Budd Co., Automotive Div.—S. A. Mahan, Jr. has been promoted to general manager-manufacturing.

Borg-Warner Corp., Byron Jackson Div.—E. S. Dulin has retired as board chairman.

Chrysler Corp.—Edward W. Salley, staff executive in the treasurer's office, has retired after 46 years.

Allis-Chalmers Mfg. Co., Research Div.—Will Mitchell, Jr. has been promoted to acting director.

Humble Oil & Refining Co., Esso Standard Div.—B. A. Warren has been named general manager of purchasing department.

J. I. Case Co.—A. Earl Lee has been appointed marketing coordinator.

Ford Motor Co., Aeronutronic Div.—Leland C. Pleger has been appointed marketing and planning manager for tactical weapon systems operations.

Electric Autolite Co.—William B. Fors has been named advertising director.

Necrology

Louis Kirke Douglass, 82, retired founder and president of the American Brass & Iron Co., died Sept. 27 in Pleasant Ridge, Mich.

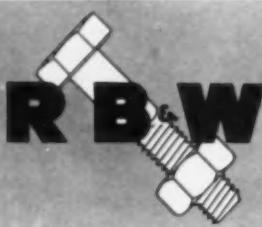
Newell H. Hubbard, 65, retired senior buyer for Ford Motor Co., died Sept. 26 at his home in Dearborn Township, Mich.

James S. Clark, 59, executive assistant advertising manager for Chevrolet Motor Div., died Sept. 25, in Romeo, Mich.

Carl W. Naas, 66, former factory manager of Associated Spring Corp.'s B-G-R Div., died Sept. 25, in Celina, O.

Hartwell G. Inger, 53, chief accountant for the U. S. Rubber Co., died Sept. 24 in Detroit.

Tait M. Hawkins, 56, advertising and sales promotion manager for Studebaker-Packard of Canada Ltd., died Sept. 20, in Hamilton, Ont.



FASTENER BRIEFS

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY



Technical-ities

By Fred E. Graves

Fastening of "vibration" joints

With static assemblies, your only fastening worry is enough safe load capacity. But with dynamic loading, you also have to guard against loosening.

HIGH THREAD TENSION

You'll find one of the best locking mechanisms within the fastener itself: high thread tension. Obviously, the tighter the fastener, the higher the tension and the better the "lock."

CASE HISTORIES

(1) Textile looms notoriously suffer from vibration. Yet their bolts stay tight *without any locking device* when highly pre-loaded. (2) Heavy duty shakers had joint loosening problem which was solved for good when the maker switched to *high strength hex bolts torqued up almost to yield strength*.

Using split lock washers gives no such guarantee against loosening. It becomes equivalent to a solid washer at a relatively low load level. Once the screw has loosened to the point where the washer becomes a spring, it's too loose for safety.

When you can't fully utilize a high strength fastener, go to a bolt with prevailing torque lock nut; or to a unit that combines high thread tension along with a high off-torque value (such as RB&W's TENSILOCK fasteners—see Bulletin TL-2.)

With vibration joints involving thin gauge or sheet metal, it's better to use a *thread-cutting screw*, than a machine screw in tapped hole. It gives 100% depth of thread contact for more thread friction to resist backoff.

Some ideas for savings through cold forming



It generally costs less to cold-form a part than to machine it, since there's less scrap loss and more speed. The cold working strengthens the part, too—improves its physicals.

These four cases show what happened when designers and production men referred their needs in special parts to RB&W.

1. **Ball-head stud.** Formerly produced on screw machine, this truck mirror pivot suffered high scrap loss, cost 75% more than it did when RB&W produced it by cold forming and some secondary machining.
2. **Spacer.** Cost of this automobile trunk hinge spacer was cut 50% when RB&W cold-formers took on the job of pounding them out at high speed, finely finished and ready for installation.
3. **Taper plug.** Time and money were both saved by manufacturer of expansion bolts who came to RB&W to make these parts. Cold headers formed them faster than screw machines, and with zero scrap.
4. **Adjustment cam.** Cold forming affords the *only* economically feasible way to produce this part. Due to its large eccentric and hex end, machining and material costs would be excessive.

These examples typify a range of work from RB&W cold heading and cold forming facilities. RB&W also performs many secondary operations on parts to specification, such as drilling, slotting, knurling, etc. Best way to see whether you have a part that could cost you less is to refer it to RB&W for study. Write Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, New York.

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila., Pa.); Pittsburgh; Detroit; Chicago; Dallas; San Francisco.

an Editorial



The National Automobile Show

THE NATIONAL ECONOMIC ENVIRONMENT which provides the background setting for the National Automobile Show is considerably better than appears on the surface. This is important both to the automobile manufacturers as well as to the viewers of the 1961 cars and trucks. The new designs and styles of vehicles will certainly create a tremendous surge of consumer desire and demand. The conversion of these aspects into actual sales depends to a large degree on whether or not people think they can afford to buy in view of business conditions.

TO A LARGE EXTENT, automobile manufacturers influence public opinion by the attitudes which are displayed when prospective buyers consider their problems of buying. It might be well to review a few of the facts which might be used to reassure prospective buyers about the general business outlook. Facts used by the major purchasing executives in industry could be accepted for such purposes, since purchasing attitudes generally are not excessively optimistic.

IN THE LAST ISSUE OF THE BULLETIN of the National Association of Purchasing Agents, A. W. Zelomek, Economist for the International Statistical Bureau, Inc., cited facts which might well have served to help many of the largest buyers in America form their opinions of the immediate outlook. In discussing this situation he said that business, consumer and government spending will trend moderately higher in coming months. "Consumer spending will provide the greatest stimulus." Firmness in prices is likely, he continued, and the Consumer's Price Index may edge up slightly. The easier money policy will continue. The cost of money will trend lower. The supply of money will be greater.

"GENERAL BUSINESS," MR. ZELOMEK CONTINUED, "has a more solid foundation than would be indicated by sentiment . . . Business investment in new plant and equipment is scheduled to increase moderately. Most of it will be in equipment rather than in plant . . ."

"TOTAL CONSUMER SPENDING WILL AVERAGE up to 5% higher, reflecting the increase in personal and disposable income . . . The increase in spending will be for both durable and nondurable goods as well as for services. It is definitely favorable to the automotive outlook. The increasing importance of the compact cars and modifications of the standard makes should stimulate a greater volume of sales for the 1961 models. At least it will encourage a higher output later on."

MR. ZELOMEK POINTS OUT THAT constructive factors justify a moderately optimistic attitude for the rest of the year. "I believe," he added, "that business sentiment will improve with increased awareness that we are not on the eve of a major recession."

WE SALUTE MR. ZELOMEK for his courageous statement. If industrial purchasing executives throughout the country are following such opinions in their planning, it is certainly wise and sound judgment for trade buyers and household buyers to follow the lead of business sentiment. Such opinions, widely held, could make the 1960 National Automobile Show the start of a year of such success that total production eventually could exceed 1959-1960 levels. As predicted in our August 15 editorial, we expect that the new models shown at Cobo Hall will open a year of good business for the industry which will definitely exceed levels of the year just closed.

Harry W. Barclay
Editor and Publisher



Presenting!

NATIONAL BUD UNITIZED

TRADE MARK

Flanges, if desired, are available to simplify positioning and removal



National BUD UNITIZED has integral wear ring presenting rubber surface to shaft. Wear ring turns with shaft, sealing lip is never exposed to damage, cannot score shaft.

A new unitized oil-seal-and-wear ring that eliminates:

SHAFT WEAR OR SCORING

SEPARATE METAL WEAR SLEEVES

EXPENSIVE SHAFT FINISHES

COSTLY SHAFT RE-MACHINING

SEALING LIP INSTALLATION DAMAGE

SPECIAL INSTALLATION PROCEDURES

New National BUD UNITIZED seals are now in production, in a limited range of sizes, for heavy oil and grease sealing applications — including truck, bus and tractor uses. Still newer BUD UNITIZED seals are on the way for higher speed automotive and similar uses.

Changing a National BUD UNITIZED oil seal automatically changes the wear sleeve — in one fast, simple operation. Since the seal has its own integral

wear ring, it is almost impossible to install it other than squarely on the shaft. Expensive shaft finishing is no longer a necessity, nor is leakage under a metal wear ring a problem — both thanks to the rubber surface BUD UNITIZED presents to the shaft.

For complete details or skilled engineering help on application of BUD UNITIZED seals, write direct, or call your National Seal Applications Engineer. You'll find him in the Yellow Pages, under Oil Seals.

NATIONAL SEAL

Division, Federal-Mogul-Bower Bearings, Inc.

General Offices: Redwood City, California

Plants: Van Wert, Ohio, Redwood City

and Downey, California





Popular **CHEVROLET**

Twenty models with entirely different eye appeal

THREE'S an air of excitement about Chevrolet's 1961 car market olympians. Twenty models in distinctive body styling, feature new roof treatment. Power available includes the 6-cylinder, 235.5-cu in. OHV, the 283-cu in. and 348-cu in. V-8's.

With the new body the "dog leg" at the front has been eliminated, thus making it easier to get in and out of the car. Entrance height, door width, and step height all are more favorable to the occupants. Station wagon tailgate openings are wider and higher, while loading height has been reduced.

Although the new models are mounted on 119-in. wheelbase as before, over-all length

is slightly shorter and bodies are narrower.

The station wagon line is comprised of the Brookwood, Parkwood, and Nomad series, all available in 4-dr, 6-pass. and 4-dr, 9-pass. models.

The line-up of series and models, common to both the Six and V-8 engine lines, is as follows: *Biscayne*:—2-dr, 6-pass. sedan; 4-dr, 6-pass. sedan; 2-dr, 3-pass. utility sedan. *Biscayne Fleetmaster*: 2-dr, 6-pass. sedan; 4-dr, 6-pass. sedan. *Bel Air*: 2-dr, 6-pass. sedan; 4-dr, 6-pass. sedan; 2-dr, 5-pass. sport coupe; 4-dr, 6-pass. sport sedan. *Impala*: 2-dr, 6-pass. sedan; 4-dr, 6-pass. sedan; 2-dr, 5-pass. sport coupe; 4-dr, 6-pass. sport sedan; 2-dr, 5-pass. convertible.



A Sporty **CORVETTE**

New refinements in body, engine, chassis

CORVETTE embodies a number of changes giving the car a new look. Rear body panels and a new rear end treatment have been changed to effect new eye-appeal at the side. To enhance its front-end appearance, the front has been treated to a new grille, different emblem and name plate treatment, plus painting of headlamp bezels. Seat upholstery has lots of appealing features that are new.

More refinements within the interior are as follows: The car now has sunshades, parking brake alarm, courtesy lights, and windshield washer as standard equipment.

Because of the change in rear body panels,

the underbody has been suitably revised and now has a narrower floor tunnel. Corvette is the only American automobile manufacturer who has successfully produced a fibre glass body shell for a production automobile.

It first introduced this type shell structure in 1954 and has been used on the Chevrolet sports car ever since.

A variety of options are available to suit every taste. Engines, transmissions, and gear ratios are provided to suit individual requirements. Engine horsepower available ranges from a standard engine of 230-Bhp. at 4800 rpm to a fuel injection engine of 315-Bhp. at 6200 rpm.



The Trim **CORVAIR**

Changes in engine promise increased fuel economy

CORVAIR carries on in the 1961 Chevrolet line, except for exterior decorative treatment and seat and sidewall trim.

In terms of models the line has been expanded by the introduction of Lakewood station wagons; and Greenbrier sports wagons, the latter mounted on a 95-in. wheelbase, and is described elsewhere in this issue.

The line-up of models and series is as follows: Standard (500) and Deluxe (700) 4-dr., 6-pass. sedan; 2-dr., 5-pass. club coupe; 4-dr., 6-pass. Lakewood station wagon; Monza (900) 2-dr., 4-pass. sport coupe; and, the Greenbrier.

Detail changes and improvements have

been made in the engine, including an increase in displacement to 145 cubic inches.

Changes made in the engine promise increased fuel economy, particularly in cold weather operation. Hand operated chokes replace the single remote control automatic choke used last year. A change in float bowl venting, made possible by choke relocation, reduces carburetor sensitivity to induction system restrictions.

Venting is so arranged that fuel is more accurately proportioned, thus preventing over rich mixtures due to improper air cleaner maintenance.

Further improvement in carburetion is gained by modification of the venturi cluster to produce greater fuel dispersion with better distribution of mixture to the combustion chambers.

For improved cold weather operation, engine cooling air is re-circulated through the engine compartment, shortening warm-up time and maintaining a warmer engine.



Elegant CADILLAC

HANDSOME as its market opportunities, the Cadillac enters 1961 with 12 models in three series: The Sixty, Sixty-Two and Seventy-Five completely restyled as to eye appeal and sheet metal. Wheelbase is 129.5 in. on the Sixty and Sixty-Two, 149.8 in. on the Seventy-Five. Overall length is 222 in., except the Seventy-Five, which is 242.3 in.

The change to new bodies and sheet metal makes the cars easier to get in and out of. Head room and leg room are increased; seating comfort enhanced with chair height seating. Entry and exit are improved by a rear door opening $7\frac{1}{2}$ in. greater, by moving the center stub pillar forward, by narrowing the rocker shelf, and by increasing door opening heights.

The body tunnel is narrower and lower. This stems from a repositioning of the engine and transmission; while chassis and frame modifications permit lowering of the front floor section.

Some noteworthy changes and improve-

Completely restyled; easier entry; more head room and leg room added

ments have been made in mechanical units. Chief of these is an entirely new front suspension system, employing an upper control arm in combination with an adjustable strut for the lower suspension element. The latter provides control of fore and aft deflection of front wheels. This changes the geometry of the front suspension system; makes it possible to move the front brake drums well into the air stream. This feature, combined with fins on the extended drums, makes it feasible to use a larger wheel cylinder.

The engine is unchanged in basic design and specification data.

FALCON

Bidding for Fame

Noteworthy improvements added to Ford's winning compact



HAVING established an enviable record during its first year, the Ford Falcon enters the 1961 season with noteworthy improvements. Perhaps the major item of interest is the availability of an optional 170 cu-in. displacement version of the standard 144 cu-in. engine.

All cars sold in California will be equipped with the sealed crankcase ventilation system—emission reduction control, as it is termed.

The same line-up of models is continued,

namely, Tudor and Fordor sedans; and Tudor and Fordor station wagons.

Both engines are fitted with a snorkel type air cleaner. It is said to promote quietness, more uniform air flow, and smoother operation at high speeds. A die-cast aluminum engine front cover replaces the stamped steel cover. It is lighter and provides better sealing.

The 170 cu-in. engine, available with either manual or Fordomatic transmission, has a single venturi carburetor.



A Sparkling **COMET**

**New 170 cu-in. engine
optional on 1961 models**

THE 1961 Comet continues the sparkling styling features that marked its entry into the compact car field earlier this year.

Some of the 1961 styling modifications include detail changes in parts of the exterior trim. One of these is a new front grille. The

Comet's dual headlamps have been moved forward also. Now they have individual stamped aluminum bezels.

But the biggest news is under the hood. Lincoln - Mercury Division has announced that a new engine is available on the new Comet. This new engine boasts a 170 cu-in. displacement. It will be offered in addition to the standard 144.3 cu-in. engine.

What are some of the details on the new engine? While the engine has the same bore as the basic 144.3 cu-in. engine, the stroke is longer on the new option. Thus, though the block is similar on both engines, the 170 cu-in. engine has shorter connecting rods and a new crankshaft.

The cylinder head has a different combustion chamber also. Intake valves are larger.

Besides the changes in engine components, other drive line elements are modified to take the larger engine. The rear axle has new pinion and drive gears; the automatic transmission is water-cooled. Several modifications apply to both engines. Front cover is of die-cast aluminum; vertical ribs are added to oil pan for rigidity.



FORD for 1961 features in its handsome styling a flat roof line, a full width aluminum grille and rounded tail lights.

Distinctive engineering highlights are many. Some of them include: self-adjusting brakes, a new V-8 engine, a roll-down window on station wagons, and an "extended chassis lubrication" system.

The new V-8 engine lists a displacement of 390 cu-in. A high performance option of the 390 cu-in. engine is also available. This engine has a larger four-barrel carburetor, a different camshaft and other special features.

Important changes have been made in the Cruise-O-Matic automatic transmission. It is lighter and shifting is more precise. An interesting note here is that the usual mechanical linkage from the accelerator pedal has been eliminated.

Instead, the transmission is equipped with a vacuum throttle control. This relays the driver's accelerator pedal setting.

Chassis working parts have semi-permanent lubrication. Small threaded plugs are used in place of regular grease fittings.

The *Fascinating* **FORD**

*Important changes in
the Cruise-O-Matic; new
V-8 engine introduced*



MERCURY is Graceful

SWEEPING changes have been incorporated in the Mercury line for 1961. Reduction in wheelbase, coupled with a fresh styling approach, introduces entirely new bodies. The reduction in wheel base is from 126-in. to the present 120-in. This reduces the car's overall length roughly five inches. With this has come a reduction of weight. Approximately 200-lbs. on the average. The new Mercury also features "Cushion Link" suspension on all four wheels. This is supplied on all models except the lowest priced series.

Mercury for 1961 now offers the 223 cu-in. 6-cylinder engine on the two lower priced series. Another member of the family is a new 292 cu-in. V-8. This is a smaller displacement version of the 312 cu-in. V-8 supplied last year. The engine is fitted with mechanical valve lifters. The 352 cu-in. V-8 is the power option for all Mercury series. It has a two-barrel carburetor and is fitted with hydraulic valve lifters.

Newest addition is the 390 cu-in. V-8. It is fitted with a four-barrel carburetor and has

Shows fresh styling and reduction in wheelbase

a high compression ratio. It operates on premium fuel. This engine is available for all series except the "600." An emission-reduction package is standard on this engine. This is a closed crankcase ventilation system. It also is available as an option on all engines.

Automatic choke is standard on all V-8 engines. Other features incorporated in the 390 cu-in. engine are: cast aluminum front cover; slipper type piston with dish type dome; dual valve springs with secondary damping spring wound in opposite direction to main valve spring.

The 1961 Mercury line also offers a wide selection of transmissions and axle ratios.

**Plymouth offers choice of 26 models,
5 engines and 4 different transmissions**

MAJOR engineering and styling gains are featured in the new 1961 Plymouths. They have been made in the areas of economical operation, driving, appearance and riding characteristics. The design of the car is smooth and uncluttered. Viewed from the side it is seen that the designers have reduced the mass of the rear of the car. Gone are the prominent fins so prevalent in recent years. Front fender lines sweep over the headlamps downward to the center of the aluminum grille.

Plymouth for 1961 offers 26 different models, five engines and four different transmissions. Also 14 body colors and 30 two-tone body color combinations. Sedans are mounted on a wheelbase of 118-in. Station wagons are on a 122-in. wheelbase.

The new inclined 30-D Economy 6 engine has a new anti-percolation feature in the carburetor. This insures quicker hot starts. There is a new choke and improved carburetor calibration for better low speed perform-

ance and economy. Improved engine breathing for better performance has been provided on the 361 cu-in. Golden Commando V-8. This is done by means of larger diameter intake valves to improve volumetric efficiency. Compression ratio on this engine has been reduced to 9 to 1 for better operation on available premium fuels.

The engine and horsepower line-up for the 1961 Plymouth is as follows: 30-D Economy Six, 145; Standard Fury V-800, 230; Super Fury V-800 (Powerpak), 260; Golden Commando High Performance, 305; and Sonaramic Commando, 330.

PLYMOUTH'S
Exciting





Delightful **DE SOTO**

DE SOTO for 1961 offers a blend of quality and economy. The established engineering and styling elements such as single unit construction, torsion bar suspension, and the finned look have been retained. The new 1961 De Soto operates on regular gasoline. The 361 cubic inch V-8 engine that is standard in all De Sotos for '61 has a 9 to 1 compression ratio with a horsepower rating of 265. Engineers lowered the compression ratio, from 10 to 1 to give De Soto its new, economical power plant.

Performance is undiminished, however, because the intake valves have been enlarged for greater efficiency. Also, the Torque-flite three-speed transmission available on all De Sotos serves to increase gas savings and performance.

The new De Soto engine carries an alternator rather than a generator. The alternator charges at idle, preventing battery discharge. It contributes to longer battery life.

In styling, De Soto has a streamlined look

Features sweeping fins and smooth, low lines

of motion with sweeping fins. All De Sotos for 1961 will be hardtops. Two-door and four-door hardtops will be offered. The design of the new De Soto starts with canted headlights framing a horizontal grille topped by a distinctive air scoop. The sides are clean with one spear of molding running the length of the car. Sculptured fins begin at the front doors and sweep back to balance the curving rear deck.

The windshield slants straight up to the roof line, eliminating distortion caused by a curved upper edge. The glass still occupies the same area as last year's model. A new roof design on the four-door model features twin speed lines from front to rear.

*Adds a new low
price two-door
sedan and hard-
top to '61 line*



VALIANT *has Vitality*

VALIANT offers a more complete line of body styles for 1961 in the low-price, compact car class. Added to the line are a new two-door sedan and a two-door hardtop. In many ways the 1961 Valiant has been improved for operating economy, durability, performance, and smoothness of ride. In external appearance it continues to accent the beauty of line and proportion. Most noticeable change from the front is the new grille.

All models are powered by a six-cylinder, overhead valve engine with a displacement of 170 cu-in. Inclined 30 degrees from the vertical to permit use of a unique manifold for maximum fuel economy, the Valiant en-

gine has a horsepower rating of 101. This year the compression ratio has been reduced from 8.5 to 8.2 enabling the engine to handle non-premium fuel in a more efficient manner.

The Oriflow shock absorbers have been redesigned for quieter operation. The valves now open more smoothly and quietly. Speed, performance, and economy are improved by revised calibration of the choke and carburetor. The life of the body has been increased through improved corrosion protection. The manual transmission shift linkage has been improved to provide a more positive feel of the shift pattern. The gear shift lever has been made longer and higher.



Good Looking **LANCER**

*Compact is powered
by a slanted six
cylinder engine*

DODGE'S spirited new entry in the compact car field is the 1961 Lancer. This car is mounted on the 106.5 in. wheelbase chassis. It features a fully unitized body. The four-door sedan has an overall length of 188.8 in.

The Lancer offers two Slant Six engines; 170 cu-in. standard and 225 cu-in. optional. Both have a compression ratio of 8.2 to 1. Both have single-barrel carburetors. What is significant, however, is that the 170 cu-in. engine also is available with a dealer-installed four-barrel package for exceptionally hot performance. The standard 170 cu-in. engine has maximum horsepower of 101 @ 4400, torque of 155 lb. ft. @ 2400 rpm. The 225 cu-in. engine is rated 145-bhp @ 4000-rpm, torque of 215 lb-ft. @ 2800 rpm.

The trim new compact will be available in seven body styles in two series. Lower-priced "170" series-taxi model, 2-door sedan, 4-door sedan, 4-door station wagon; deluxe "770" series 2-door hardtop, 4-door sedan and 4-door station wagon.

The design of the Lancer is clean, functional and classic. The grille, hood and bumper thrust forward in a "V." The car has wrap-around front and rear bumpers. It has dual headlights and circular parking lights are recessed below the front bumper.

Among the optional equipment items offered are: air conditioning, power brakes and power steering and automatic transmission. Also optional are heater and radio.



DISTINCTIVE and fresh styling is emphasized in the 1961 Pontiac line-up of four series in 15 body styles. Catalina and Ventura series cars are mounted on a 119-in. wheelbase chassis. Star Chief and Bonneville are mounted on a 123-in. wheelbase. However, the two-seat Safari in the Bonneville series has a 119-in. wheelbase, same as the other Safari models.

The basic Pontiac chassis embodies many changes and improvements. First of these is the new "perimeter" chassis frame, made in eight styles. This frame design makes for greater accessibility for servicing. It also permits use of a simplified drive line and exhaust system.

The entire suspension system has been revised and features a different rear suspension. Shock absorbers are integrally-mounted to effect better torque retention of attachment bolts.

Although the basic 389 cu-in. engine remains the same in specification detail, it embodies numerous improvements in design and construction. As a result, the 1961 versions are lighter in weight and more compact.

The **Fashionable** **PONTIAC**

*Basic 389 cu-in. engine
features improvements in
design and construction*



Dashing **TEMPEST**

Inclined four cylinder engine a new breed

IN the Tempest, Pontiac has introduced the first modern car in many years powered by a four-cylinder engine. The Tempest engine represents an entirely new breed of machine. It is neither small nor low-powered. It is a modification of the right bank of the new Pontiac V-8 engine, inclined at a 45-degree.

The Tempest line consists of a four-door sedan and a station wagon. Each is mounted on a 112-in. wheelbase. Both are six passenger vehicles with fully unitized bodies.

Pontiac has created for the Tempest a

different kind of chassis. It is the first to employ a transaxle with swing axles at the rear and front mounted engine.

The engine and transaxle are joined by a rigid torque tube to provide a firm backbone for the drive train. Operating within this curved torque tube is a unique propeller shaft. The shaft is made of $\frac{5}{8}$ -in. diameter alloy steel forging, heat and shot treated to gain high fatigue life in car service.

The Tempest offers two types of drive: The standard synchromesh transmission and an optional automatic transmission.



REVIVAL of the Buick nameplate—Special—introduces Buick's entry into the low-priced field. The Special, with a newly styled and fully unitized body, has a wheelbase taped at 112-inches. It has two body styles: sedan, and four-door station wagon in both standard and deluxe models. Styling is distinctive.

The Special features the first generation, mass-produced, all-aluminum V-8 engine. It has a unique suspension and drive line with a special version of the Buick automatic torque converter type of transmission.

The entire front suspension is integrated as a unit tied into a front cross-member. The cross-member, in turn, is attached to the integral body frame with three rubber type insulation mounts. The rear coil spring suspension is coordinated with a rear axle of new design. The rear suspension system is of the four-link type. The lower links reach from brackets on the tubular arms of the axle bed to an attachment at the body frame.

The upper links are attached to brackets integral with the main axle casting.

BUICK SPECIAL

Alive

*Economy stressed,
engine and transmission
lightweight and new*



BUICK

The Beautiful

*Mechanical changes
plus unique styling
prominent this year*

BUICK still sporting modified front fender port holes embodies many distinctively new mechanical and style changes. For one thing, the characteristic torque tube drive has been eliminated. In its place there is a two-piece propeller shaft drive. It has a new constant velocity joint in the drive line.

There are new refinements in the front suspension and a new three-link rear suspension. The Buick Turbine Drive transmission has become standard equipment on LeSabre, the Invicta, and Electra.

The noteworthy item in front suspension: Front wheel hubs are redesigned to accommodate tapered roller bearings with a new synthetic rubber lip-type seal.

The rear suspension is of three-link design, with two lower links taking the driving forces. The third link is of adjustable design to effect the proper joint angle in the two-piece driveline.

Renowned **RAMBLER AMBASSADOR**

Featured is a ceramic coated exhaust system



THE Ambassador's distinctive styling and new engineering make it renowned in the luxury compact car field. The Ambassador V-8, built on a 117-in. wheelbase, is available in 6 four-door models. This includes a Super and the Custom sedan, two and three seat station wagon, all are unique in styling simplicity.

It features a new ceramic-coated muffler and tailpipe, an acoustical fibre glass ceiling

panel, vacuum powered four-door locking system, and a new heating and ventilating system. Also, a new air conditioning system is optionally available.

The Ambassador's 250 horsepower V-8 engine is equipped with a twin-barrel carburetor. It has a compression ratio of 8.7 to 1, and a displacement of 327 cu-in. The bore and stroke are, 4 x 3 1/4 inches. It will operate efficiently on regular gasoline.

Illustrious STUDEBAKER LARK

Longer four-door sedan is newcomer for 1961



IMPROVED performance from a brand new engine, added eye appeal, and a larger-car option are major features of the '61 Studebaker Lark line.

The new 170-cu-in. OHV six is rated 112-hp at 4500 rpm—compared to the 90-hp rating of last year's L-head engine. Compression ratio is 8.5 to 1.

Optional engine on the two car series—Regal and Deluxe—is a 259-cu-in. V-8.

Extensive sheet metal changes on all '61 Larks give a longer-lower look. Roof is new

and has been lowered one inch; cowl level similarly is lower. Also new are the windshield, hood, and rear deck, as well as grille and bumpers.

Lark models for '61 include a convertible in the Regal series.

This year's newcomer model is a four-door sedan on a 113-in. wheelbase—added to the regular 108½-in. wheelbase models. It comes only with a V-8 engine—the 259-cu-in. being standard, rated 180 hp; and the 289-cu-in. Hawk engine, rated 210 hp, being optional.



Classy **CHRYSLER NEWPORT**

*New for 1961, the Newport economy series
is powered by a regular-gas V-8*

CHRYSLER for '61 has introduced a full-sized model, designated the Newport, to compete in a lower price range than prior Chryslers. It is a companion to the well-established Windsor series.

The Newport is powered by a 361-cu-in. V-8 having a 9 to 1 compression ratio and two-barrel carburetor, rated 265 hp with regular gasoline.

Both the Newport and Windsor models have a wheelbase of 122 in. The Windsor, however, is equipped with a 383-cu-in. V-8

with 10 to 1 compression ratio. Its carburetor is likewise two-barrel type.

A three-speed manual shift transmission, with a floor-mounted straight shift stick, is standard on Newport as well as Windsor series.

Styling changes for '61 include a longer hood, single-curvature windshield, and new superstructure. The grille is also new, and consists of horizontal bars of extruded aluminum, surrounded by a zinc-die-cast chromium-plated molding.

The Distinguished **IMPERIAL**

Distinctive "classic-car" approach predominates in '61 Imperial styling



EXPANSION of the "classic-car" look in the 1961 Imperial is evidenced by restoration of "free-standing" headlamps. Each of the four individual lamps has a die-cast aluminum body, pedestal-arm-mounted on the gravel deflector.

Tail lamp treatment, too, is distinctive. The suspended tail lamps are die-cast aluminum pods supported by arms extending from the rear fins.

The grille is simple in design and is a modern adaptation of the "classic" self-contained assembly.

Rear panels of the '61 Imperial have been extended to emphasize the impression of length and directed motion.

Inside, the instrument panel, steering wheel, door panels, and seat styling are all new. Spokes and hub of steering wheel are covered with vinyl safety padding.

The Chrysler 413-cu-in., 350-hp V-8, with four-barrel carburetor and 10 to 1 compression ratio, still powers the Imperial.

Sophisticated **CHRYSLER NEW YORKER**

*New exterior styling and
more luxurious interiors head '61 features*

THE New Yorker, traditionally the top luxury model bearing the "Chrysler" nameplate, has been made even more luxurious for 1961.

Practically all exterior sheet metal is either new or reworked. Grille is also new, and is comprised of horizontal extruded-aluminum bars combined with vertical risers. The grille assembly is encircled by a zinc-die-cast chrome-plated molding. The two headlamps each side are now canted and framed within a bright finish bezel. Parking-direction signal lamps at front are also canted, and are pleasingly streamlined into the fenders above the bumper.

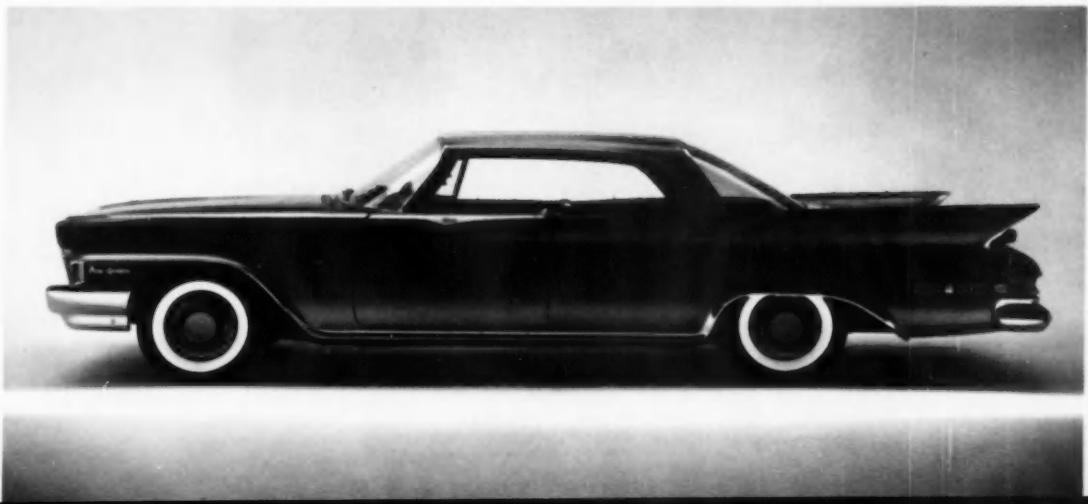
Wheelbase of the New Yorker is 126 in. Engine continues to be the 413-cu-in. V-8

with four-barrel carburetor and 10 to 1 compression ratio, rated 350 hp at 4600 rpm.

The New Yorker is obtainable in five body styles—four-door sedan, four-door hardtop, two-door hardtop, convertible coupe, and four-door hardtop station wagon.

As is the case with all Chrysler models, a closed crankcase ventilation system will be installed on cars for Calif. delivery.

In summary, the "Chrysler" lineup of models for 1961 consists of the Newport, Windsor, New Yorker, and 300G—the latter powered by the 413-cu-in. V-8 equipped with ram induction and two four-barrel carburetors, rated 375 hp at 5000 rpm. The 300G will be available in a convertible coupe and a two-door hardtop.





Glowing **OLDSMOBILE F-85**

Olds' new contender in the popular-price field

A HOST of design innovations are presented in the Oldsmobile F-85—spanking new for 1961.

Mounted on a 112-in. wheelbase, the F-85 has unitized body construction, and is powered by an aluminum V-8 engine. Its overall length is 188 in., and curb weight of the four-door sedan is 2695 lb.

The new aluminum watercooled V-8 has a bore of 3.5 in. and stroke of 2.8 in., for a total piston displacement of 215 cu-in. Compression ratio is 8.75 to 1, for use with regular-grade gasoline. Output rating is 155 hp at 4800 rpm. Basic engine weight amounts to about 350 lb.

Cylinder block, heads, pistons, intake manifold, clutch housing, and water pump are all made of aluminum alloy. Cylinder liners—which are cast in the block—are of centrifugally-cast cast iron. Cast iron also is employed for valve guides, main bearing caps, and exhaust manifolds. Camshaft and crankshaft are castings. Hydraulic valve lifters are standard.

Syncromesh transmission is standard, with an entirely new Hydra-Matic, having three speed ranges, being offered as optional equipment.

Air conditioning also is available on the F-85 as optional equipment.

THE '61 Oldsmobile Super 88, and its companion series the Dynamic 88 and 98, incorporate an impressive array of styling and mechanical changes. Bodies are entirely new.

Mechanical advances include a new three-speed-range Hydra-Matic transmission, slimmer and 70 lb lighter in weight.

While wheelbase of the 88's remains at 123 in., overall length has been reduced 5.6 in. to 212 in. Similarly, the wheelbase of the 98 is still 126 in., with overall length reduced 3.0 in. to 218 in. Exterior body widths are 3.8 in. narrower.

The same basic 394 cu-in. V-8 is used in all series. Engines for the Super 88 and 98 have 10 to 1 compression ratio and four-barrel carburetor—rated 325 hp at 4600 rpm. For the Dynamic 88 the engine has a compression ratio of 8.75 to 1 and two-barrel carburetor—rated 250 hp at 4500 rpm.

Rear suspension now includes coil springs, replacing the prior leaf springs.

A unique feature embodied in the '61 line is vertical mounting of the gasoline tank—permitting a deeper floor for the luggage compartment and increasing luggage capacity. Spare tire, with this arrangement, is housed on rear shelf of compartment.

Vivid **OLDSMOBILE** **SUPER 88**

*Many styling and
mechanical advances
introduced in '61 Olds*





DODGE POLARA

Splendorous

SPORTING rocket-like tail lights and fenders, Dodge's Polara features completely new styling, elegant new interiors, a V-8 that likes regular grades of gasoline and a number of engineering refinements.

The 122-in. wheelbase model is available in six models: 4-door sedan, 2-door hardtop, 4-door hardtop, convertible, and six and nine passenger station wagons.

The Polara offers a choice of three engines ranging in horsepower from 265 to 330. The standard engine is a 265 hp, 361 cu-in. V-8 with a two-barrel carburetor and a compression ratio of 9 to 1. Two high performance engines are available—the 325 hp D-

*Style, walloping performance
and quality in new Polara*

500 and a 330 hp model with special ram induction. Both have a displacement of 383 cu-in. and a 10 to 1 compression ratio. The D-500 is equipped with a single four-barrel carburetor while the ram induction engine has two four-barrel carbs, dual exhausts, a special camshaft and valve spring dampers.

Much attention has been given to choice of exterior materials. The rear bumper steps of the wagons are chrome-plated steel. Stainless steel is used for such applications as body side moldings, roof drip rails, window and door reveals, lower deck and quarter panel moldings. The radiator grille and headlamp bezels are of anodized aluminum stampings. Plated zinc die-castings are used for such exterior hardware as medallions, nameplates, tail lamp bezels, script, etc.

An alternator, capable of delivering up to 10 amperes while the engine is at idle, replaces the conventional DC generator.



Daring is the **DODGE DART**

COMpletely new styling and numerous mechanical refinements head the list of improvements in the '61 Dodge Dart—for its second year of introduction.

Major body changes are on the grille, bumpers, hood, fenders, roof, rear deck and rear quarter panels. Coupled with attractive trim, they give the Dart new eye appeal.

A wider selection of engines is now made available. Standard Dart Six engine is the 225 cu-in. Slant Six, rated 145 hp at 4000 rpm—with a compression ratio of 8.2 to 1, down from last year's 8.5 to 1. Standard V-8 is the 318 cu-in. with 9 to 1 compression ratio—rated 230 hp with two-barrel carburetor and 260 hp with optional four-barrel carburetor, at 4400 rpm.

Additional engine options consist of the 361 cu-in. V-8 with four-barrel carburetor and 9 to 1 compression ratio, rated 305 hp at 4800 rpm. Also, the 383 cu-in. ram-induc-

*Fresh styling, more engines
in Dodge Dart for '61*

tion V-8, with 10 to 1 compression ratio and two four-barrel carburetors, rated 330 hp at 4800 rpm. While the 383 cu-in. engine has the same piston displacement as last year, its bore has been increased from 4.03 to 4.25 in., and its stroke decreased from 3.75 to 3.38 in.

The 118-in. wheelbase, 209.4-in. overall-length Dodge Dart for '61 is offered in three series—Seneca, Pioneer and Phoenix—with a total of 24 body styles.

Optional equipment includes air conditioning, closed crankcase ventilation system, Sure-Grip differential, and dealer-installed automatic beam changer and Auto-Pilot.

LINCOLN'S *Luxury Lure*



Continental wraps design features in elegant package

LINCOLN'S prestige car, the Continental, has been completely redesigned for 1961 with elegant simplicity. Mounted on a 123 in. wheelbase (131 in. last year) with an overall length of 212 in., it is offered in two body styles—four-door sedan and convertible.

Improvement in ride has been accomplished through use of a "silent strut" at the front. The suspension lower arm is attached to a body cross member by means of an isolated strut containing a rubber bayonet-type bushing. Rear leaf springs are 60 in. long, 2½ in. wide, and are fitted with a rub-

ber bushing at the front eye. Rear springs are attached to rear axle by means of a box structure lined with butyl rubber which provides a fully isolated rear suspension.

While the engine remains the same in basic dimensions, it embodies a number of design changes including constant pitch valve springs, nylon teeth added to the cam-shaft drive sprocket, "Roto-coil" exhaust valve rotators, and the first example of a hydraulic windshield wiper system driving 18 in. blades.

A new constant-velocity universal joint with needle bearing yoke is used.



Stylish **THUNDERBIRD**

New "T-Bird" has swing-away steering wheel

THE smartly restyled Thunderbird goes to market with a number of refinements and innovations. Available in both the two-door hardtop and convertible, the line is mounted on a 113 in. wheelbase.

An optional swing-away steering wheel, with more than a 10 in. travel, pivots about a flex-coupling below the steering housing. Placing the transmission selector in "park" position automatically unlocks the steering column. Other design highlights include a lowered console, curved side window glass, aluminized muffler and tail pipes, and wider doors.

This year, the Thunderbird offers only one engine—the new 390 cu-in. V-8 with closed crankcase ventilation system. The engine is teamed with a highly refined dual-range Cruise-O-Matic transmission. A new vacuum throttle valve eliminates mechanical linkage between transmission and carburetor. Standard rear axle ratio is 2.91 to 1 with an optional ratio available of 3.10.

Redesign of the "cockpit" has increased front shoulder room by 2 in.; shoulder room in the rear has been upped 4 in., and hip room 8 in.

Power steering and brakes are standard.



Bewitching **CORVAIR GREENBRIAR**

Sports wagon paces demand for style, efficiency

MOUNTED on a 95 in. wheelbase, Corvair's Greenbriar is the highly styled member of the new series of short wheelbase, rear-powered light-duty multi-purpose vehicles.

The new units are powered by a horizontally-opposed, 145 cu-in., 80 hp, 6 cylinder air-cooled engine. For major servicing, the complete power package, including engine, transaxle and rear suspension, may be removed as a single unit.

A 3-speed synchromesh transmission is standard equipment, with a new 4-speed

manual transmission or Powerglide available as a factory installed option.

The Greenbriar features unit-frame construction, independent suspension at all four wheels, and almost equal load weight distribution between front and rear wheels. It can carry six passengers and a 700 lb load. With an optional third seat, it can haul nine passengers and 250 lb of cargo.

The load area is accessible from the driver's seat and through double doors on the right hand side and at the rear. Additional left hand doors are optional.

Shining **RAMBLER CLASSIC**

"Classic" shows design evolution

DEMONSTRATING the design philosophy of refinement and basic improvement, the 1961 Rambler "Classic" retains the styling characteristics of the Rambler line. Principal changes have been made in the grille, front fenders, hood, bumpers and trim.

The new series features a 6 cylinder die-cast aluminum block engine with bonded cast iron cylinder liners. Horsepower is rated at 127 at 4200 rpm. It has a compression ratio of 8.7 to 1; piston displacement of 195.6 cu-in., and a torque rating of 180 at 1600 rpm. An optional version with dual-throat carburetor is rated at 138 hp.

Other basic improvements include a ceramic-coated muffler and tailpipe, a new heating and ventilating system and acoustical fiber glass ceiling panels.

Front shock absorbers have been redesigned to incorporate a rebound hydraulic cut-off system that minimizes "bottoming" from severe bumps.

A vacuum-powered 4-door locking system that is controlled by the driver with an on-off switch is available as a factory installed option.

Reclining, individually adjusted seats and headrests continue to be offered. Also offered are power-steering, power-brakes, power-windows, and non-slip differential.





Radiant **RAMBLER** **AMERICAN**

*Smartly designed American
will have style stability
to hold buyer's investment*

COMpletely restyled for 1961, the Rambler American is mounted on a 100 in. wheelbase and is 5.2 in. shorter and 3 in. narrower than last year's model.

Interior dimensions have remained the same.

A convertible and a four-door station wagon have been added to the line which also includes two-door wagons and two and four-door sedans.

A choice of two engines and three transmissions with standard axle ratios is available. High-performance axle ratios are optional at no extra cost.

The 125 hp OHV Six is standard on all Custom models and optional on Supers and Deluxe models. The standard engine for Super and Deluxe series is the L-head 6 cylinder which develops 90 hp.

A special feature of the 125 hp engine is the water-heated intake manifold cover which warms the fuel mixture.

Power brakes are a new option for 1961.

Power steering is again offered as an option to meet the needs of some drivers.

Air conditioning is now offered as a factory or dealer installed option.

*Style and spirit enhanced
with bucket seats and
four-speed transmission*

Attractive

STUDEBAKER HAWK



THE 1961 Studebaker Hawk, retaining its distinctive sports car styling, has added bucket seats and a 4-speed transmission with floor stick shift. The 289 cu.in. V-8 engine, introduced in February, 1960, develops 210 hp at 4500 rpm with a torque rating of 300 at 2800 rpm.

With optional 4-barrel carburetor, the powerplant develops 225 hp at 4500 rpm with torque rated at 305 for 3000 rpm. Compression ratio is 8.8 to 1. In addition to the new 4-speed transmission, Hawks are also available with either standard, overdrive or automatic transmissions.

Bonded brake linings and finned, weather-

seal-type brake drums are standard on the new models.

Optional features include power brakes, power steering, air conditioning, Studebaker's "limited-slip" differential, and the automatic hill holder for cars with conventional or overdrive transmissions.

Options offered exclusively for the Hawk are tachometers and deck lid mounted radio antennas.

Hawks scheduled for California delivery are equipped with forced crankcase ventilation to reduce smog-producing fumes. This feature is also available on special order for customers residing in other states.



Everything's changed but the name on the bearings

In 1899, the first car equipped with Timken bearings took to the road. Today, every American make of car but one rolls on Timken® tapered roller bearings.

And there's a new kind of bearing in the 1961 power cars. It's the latest step in Timken bearing engineers' drawing board to drawing board partnership with the auto industry. It's a smaller, lighter bearing to cut unsprung weight. A more uniformly precise bearing to cut warranty costs. Capacity packed to take the heavier loads of today's luxury cars. Made of the finest bearing quality alloy steel available.

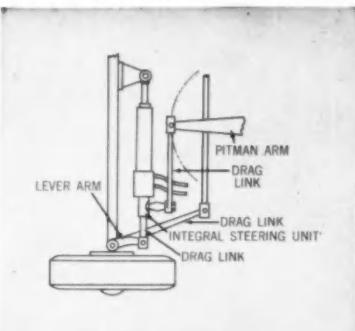
And with unique manufacturing techniques developed at our ultra-modern plant in Bucyrus, Ohio, Timken bearings have held the cost line against inflation while delivering a new high in uniform quality. The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.



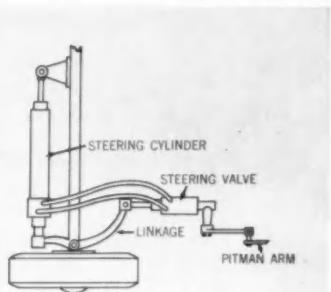
TIMKEN® tapered
roller
bearings

from the pros of the bearing business

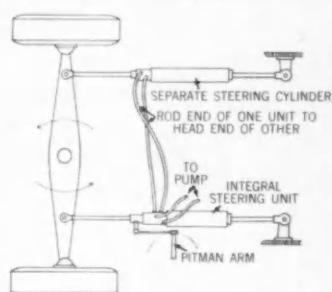
Circle 250 on Inquiry Card for more data



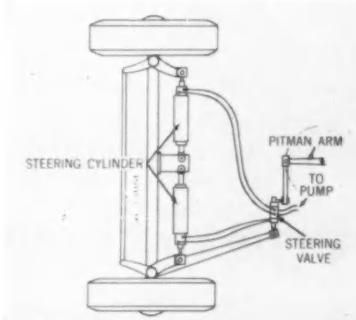
INTEGRAL LINKAGE system combines servo valve and steering cylinder with rod end fastened to frame and valve end to drag link.



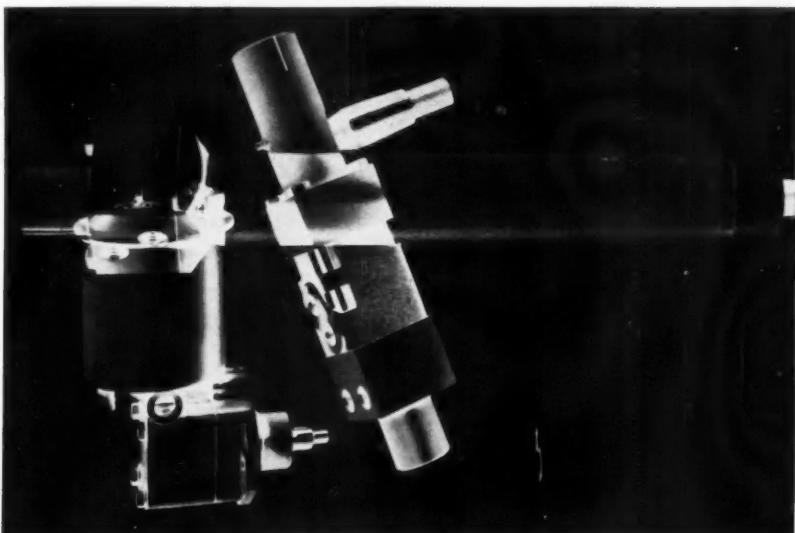
REMOTE LINKAGE system has separate servo valve and cylinder. Servo is mounted at most convenient point with cylinder located for maximum thrust.



COMBINED INTEGRAL-REMOTE system servo valve controls both cylinders. When integral unit (bottom) extends, remote unit (top) retracts.



REMOTE DUAL system uses one remote servo valve, offers best possible thrust conditions plus considerable installation flexibility.



FOR AXLE LOADINGS 1500-128,000 LBS.

New **VICKERS**. power steering systems use standard units, offer custom performance

Performance benefits normally associated with custom designs plus the economy of standard, production-built components are combined in new Vickers power steering systems. The cylinder, servo valve, and pump—key elements in the power steering system—are always perfectly matched to system needs because Vickers builds the *complete system*.

Either remote or integral systems can be provided for the complete range of axle loadings from 1,500 to 128,000 lbs. All vehicles use the same servo valve—holding engineering and installation time to a minimum and reducing inventory requirements for manufacturers building several sizes or types of equipment.

Operating Economy—Systems are designed for high pressure operation (to 2000 psi) permitting smaller pumps, lines, reservoirs, valves and cylinders to be used. Further economy results because each basic size of steering unit is capable of a wide range of axle loadings. This permits some manufacturers to use a single size of steering unit for their complete line of vehicles. For example, in a single cylinder installation, the Model SC-26 cylinder can be used for any axle loading from 16,000 to 64,000 lbs.

Further economy over the life of the system results from the minimum number of moving parts required by this design and from its rugged construction. All cylinders are double walled to eliminate the common hazard of functional damage to cylinder walls from flying

debris. Exclusive design vane pumps last longer, permit easy cold weather starting because pumping doesn't begin until after engine fires and comes up to speed.

Complete Responsibility—Both the equipment builder and ultimate user benefit because Vickers designs and builds all system components. In addition, a staff of power steering specialists is available to work with customers on specific development and application problems.

When equipment is being built for the export market, worldwide stocks and complete interchangeability of all parts made in Vickers plants throughout the free world offer added benefits.

More Data—Design advantages, dimensions, ratings, and other data are available in Bulletin titled "New Complete Power Steering Systems." Write for this 20 page Bulletin M5110.

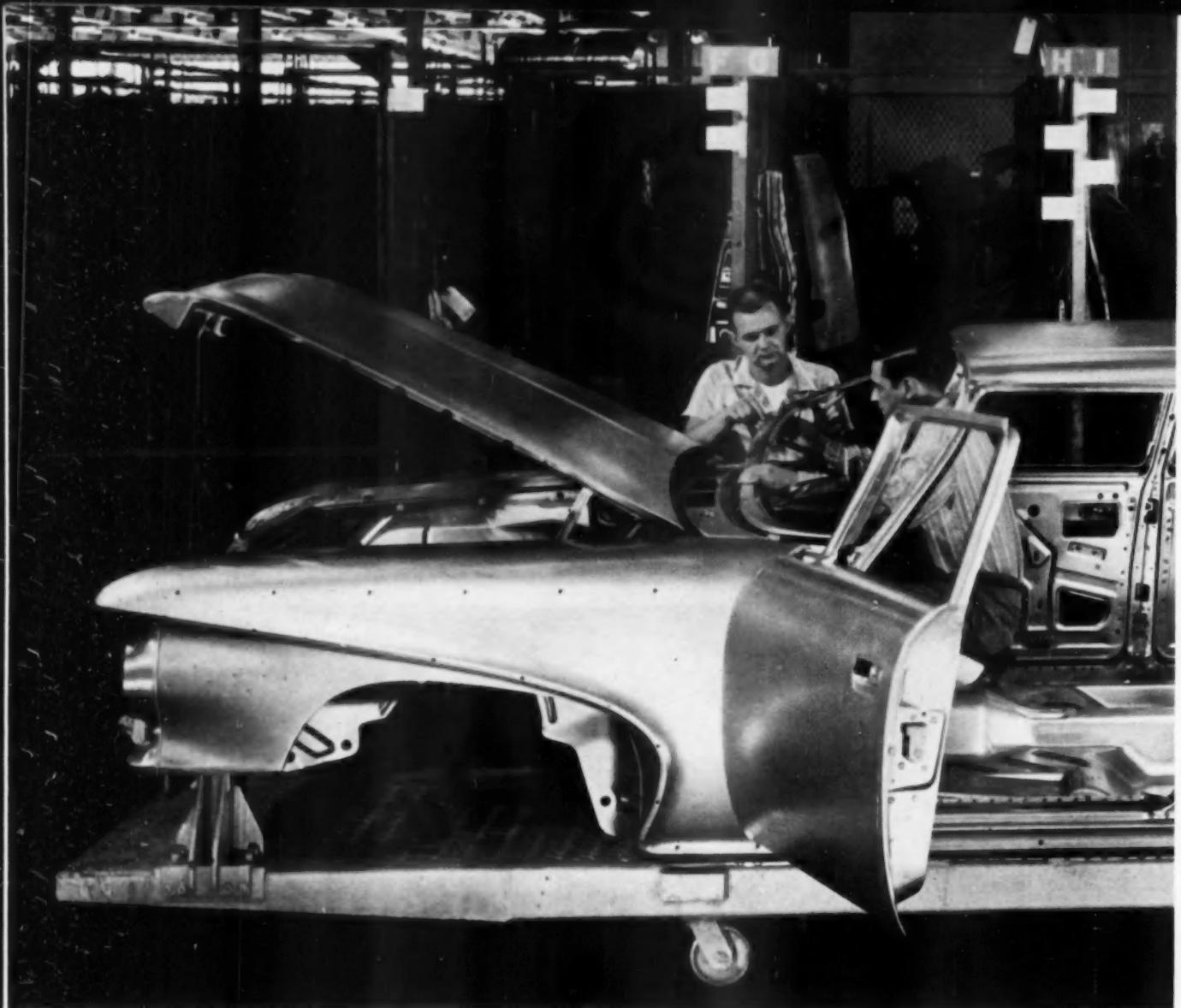
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Much of the beauty of Chrysler cars

The proper foundation of a Chrysler-style paint job shows itself in this gleaming Plymouth "body-in-white"—steel with the surface finish a truly fine car must have.

Body parts for Chrysler cars emerge from a complex of huge presses and coils and sheets of flat rolled steel. Floor pans are formed, to be wed further on into single unitized assemblies of 50 major parts by fully-automated resistance welders. Doors are stamped with great precision, and 100 ton presses squeeze out car roofs, without a break or blemish.

This is Chrysler Corporation's Ohio Stamping Plant, giant of the auto industry, where 28 major stamping lines eat 2000 tons of steel a day and produce 600 different body parts. Steel is the basic raw material of this amazing plant—and the men who buy and use it know exactly what they need. As a regular supplier, J&L matches their needs *consistently*.



Jones & Laughlin Steel Corporation

3 GATEWAY CENTER, PITTSBURGH 30, PA.





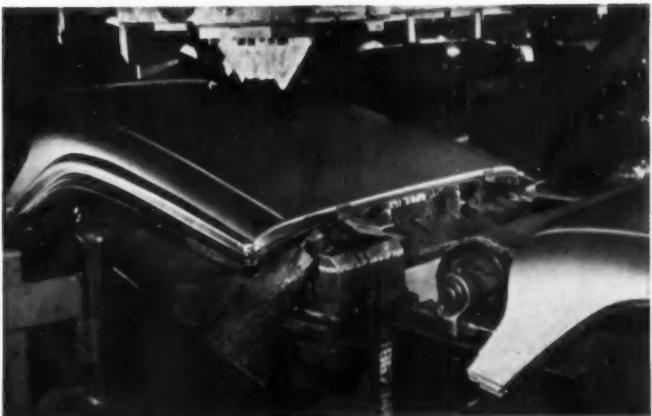
Feast your eyes on over 1000 lbs. of unadorned steel! Notice how the steel itself contributes to the elegance and grace of Chrysler styling—how, even in this raw metal stage, the "body-in-white" has a lustrous finish of real beauty.

comes from the steel itself

Each die-forming situation is individual and demands a specific set of metallurgical properties from the steel. In many cases, the factor of extreme importance is surface finish of the steel. Other times, drawing quality is paramount. And often, combinations of these and other qualities are needed, balanced one against the other with metallurgical precision.

The Ohio Stamping Plant may be big. But it is a tight operation—efficient, competitive, economical, with full control of quality at all times to insure the beauty and soundness of Chrysler bodies. That J&L steel is bought regularly, and used at one time or another in all the major parts produced by the Ohio Stamping Plant, speaks well indeed for J&L quality.

◀
This Steelmark identifies
products made of steel.
Look for it when you buy.



This is the roof line—at full rate of production. J&L is one of only three suppliers who can provide the 80-inch, 0.038-gage coils Chrysler needs here. Breaks and strain lines cannot be tolerated on roofs, so drawing quality is vital—as is surface finish, for reasons of appearance.



wheels
work
the fields



Throughout the world,
motorized farm
equipment rolls on wheels by
the **French & Hecht Division**
of Kelsey-Hayes, located in
Davenport, Iowa. This division has
worked in close cooperation for
over 74 years with leading farm
equipment and implement
manufacturers in the design,
development and production of
wheels for all mechanized
agricultural requirements.

French & Hecht Division,
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Davenport, Iowa.

**KELSEY
HAYES
COMPANY**

Automotive, Aviation and Agricultural Parts
Hand Tools for Industry and Home

18 PLANTS: Detroit and Jackson, Michigan
Los Angeles; Philadelphia and McKeesport,
Pennsylvania; Springfield, Ohio; New Hartford
and Utica, New York; Davenport, Iowa;
Windsor, Ontario, Canada.



• • INDUSTRY STATISTICS • •

By Marcus Ainsworth
STATISTICAL EDITOR

WEEKLY U. S. MOTOR VEHICLE PRODUCTION

As reported by the Automobile Manufacturers Association

Vehicle Make	Weeks Ending		Year to Date	
	Sept. 24	Sept. 17	1960	1959
PASSENGER CAR PRODUCTION				
Total—American Motors.....	8,800	7,780	349,445	284,230
Chrysler.....	1,786	1,908	63,475	51,874
De Soto.....	260	225	17,295	34,866
Dodge.....	11,463	9,650	323,049	119,886
Imperial.....	540	593	10,983	14,483
Plymouth.....	6,251	5,095	188,871	318,563
Valiant.....	4,207	3,268	193,373
Total—Chrysler Corp.....	24,507	20,729	797,046	539,672
Comet.....	5,621	5,421	135,616	27,373*
Falcon.....	12,635	11,953	375,084	5,987
Ford.....	21,732	14,748	706,580	1,100,046
Lincoln.....	13,194	19,497
Mercury.....	2,258	1,874	110,779	110,907
Total—Ford Motor Co.....	42,246	33,996	1,341,233	1,263,810
Buick.....	5,384	3,495	193,838	174,907
Cadillac.....	2,065	933	112,978	110,894
Chevrolet.....	16,566	5,294	1,187,200	1,144,674
Corvair.....	3,947	2,463	177,079	25,625
Oldsmobile.....	7,698	4,830	271,671	285,705
Pontiac.....	7,150	4,212	320,726	319,844
Total—General Motors Corp.....	42,810	21,227	2,263,492	2,071,649
Total—Studebaker-Packard Corp.....	2,407	2,331	78,646	112,049
Checker Cab.....	148	145	5,355	2,839
Total—Passenger Cars.....	120,718	86,178	4,835,217	4,275,049
TRUCK AND BUS PRODUCTION				
Chevrolet.....	7,586	6,782	293,150	272,056
G. M. C.....	1,341	1,288	81,065	64,096
Diamond T.....	65	30	2,146	4,422
Dive.....	90	80	3,016	2,756
Dodge and Fargo.....	1,448	1,359	53,704	58,119
Ford.....	4,418	6,085	263,372	251,573
F. W. D.....	27	14	725	795
International.....	2,401	2,454	95,003	100,846
Mack.....	357	336	11,553	13,337
Studebaker.....	96	42	10,042	10,001
White.....	252	261	12,515	14,961
Willys.....	1,521	1,478	98,064	87,018
Other Trucks.....	85	85	3,300	2,777
Total—Trucks.....	19,657	20,294	927,655	890,760
Buses.....	125	75	3,035	1,823
Total—Motor Vehicles.....	140,500	106,547	5,765,907	5,167,832
—Edsel production.				

NEW PASSENGER CAR REGISTRATIONS BY REGIONS*

Zone	Region	July			Seven Months			Per Cent Change		
		1960	1960	1959	1960	1959	July over June	July over July 1959	Seven Months 1960 over 1959	
1	New England.....	32,695	38,355	31,609	227,951	192,777	-14.76	+ 3.44	+ 18.25	
2	Middle Atlantic.....	114,018	126,787	101,436	779,608	651,621	-10.06	+12.40	+19.64	
3	South Atlantic.....	65,127	78,381	73,172	524,485	480,763	-14.73	-10.99	+ 9.09	
4	East North Central.....	136,240	154,802	143,918	1,005,226	938,580	-11.90	- 5.33	+ 7.10	
5	East South Central.....	24,579	24,803	23,296	181,683	161,780	- 80	+ 5.51	+12.31	
6	West North Central.....	46,104	47,425	49,163	324,700	330,809	- 2.79	- 6.26	- 1.85	
7	West South Central.....	45,570	45,437	53,679	317,365	312,370	+ 29	-15.11	+ 1.60	
8	Mountain.....	19,662	20,666	20,924	135,539	131,252	- 4.71	+ 5.89	+ 3.27	
9	Pacific.....	62,510	61,208	60,236	461,137	454,311	+ 2.13	- 9.71	+ 1.50	
Total—United States.....		546,535	595,884	566,453	3,957,704	3,654,263	- 8.28	- 3.52	+ 8.30	

* Compiled from official state records. Data property of R. L. Polk & Co. May not be copied, sold or reprinted without Polk permission.
States comprising the various regions are: Zone 1—Conn., Me., Mass., N. H., R. I., Vt., Minn., Mo., Neb., N. D., S. D. Zone 2—Ark., La., Okla., Tex. Zone 3—Ariz., Colo., Ida., Mont., Nev., N. M., Utah, Wyo. Zone 4—Ala., Cal., H. I., Ore., Wash.

1960 TRUCK FACTORY SALES BY G.V.W.

As reported by the Automobile Manufacturers Association

Period	6,000 lb. and less	6,001- 10,000 lb.	10,001- 14,000 lb.	14,001- 19,500 lb.	19,501- 26,000 lb.	26,001- 33,000 lb.	Over 33,000 lb.	Total	
	205,598	56,768	3,747	9,305	55,290	20,834	10,805	10,037	372,375
First Quarter.....	189,711	51,817	3,052	9,931	48,018	20,534	10,687	10,283	344,033
Second Quarter.....									
Total—6 Months.....	385,310	108,575	6,799	19,236	103,306	41,368	21,492	20,320	716,408
July.....	37,576	13,103	917	3,283	13,018	6,151	2,711	2,685	79,444
August.....	33,758	9,745	668	2,988	10,640	4,156	2,102	1,991	65,948
Total—8 Mos. 1960.....	466,644	131,423	8,384	25,407	126,966	51,675	26,305	24,996	861,800
Total—8 Mos. 1959.....	417,218	129,761	10,588	71,659	103,285	45,470	28,358	27,316	833,655

News of the MACHINERY INDUSTRIES

By Charles A. Weinert

Machine Tool Orders Rebound in August

Bookings of machine tool orders in August bounced back a very substantial \$14.6 million, or 34 per cent, over July's depressed volume.

As a matter of fact, August orders for metal-cutting machines achieved the monthly high for 1960. Conversely, however, August orders for the metal-forming-machine sector represented the monthly low for the year.

Net new orders for metal-cutting machines—according to preliminary figures for the month of August just released by the National Machine Tool Builders' Association—amounted to \$49.45 million. Metal-forming-machine net new orders are valued at \$8.1 million. The combined August net new order total is therefore \$57.55 million.

For the month of July, the final figures are respectively \$33.5 million, \$9.45 million, and \$42.95 million total.

June 1960's order total, covering both types of machines, was \$55.1 million. In August 1959 (a year ago), for further comparison, net new orders totaled \$52.2 million.

Of interest in the August 1960 metal-cutting-machine order results are the following facts. The level of domestic net new orders alone, at \$37.2 million, was a 1960 monthly high. Foreign business, at \$12.25 million, continued to be a sizable portion of total metal-cutting-machine orders. Metal-forming-machine net new orders included \$2.65 million foreign—in the total of \$8.1 million.

Thus far this year (eight months), net new orders for both cutting and forming type machines total \$436.4 million. Last year, the equivalent eight-months' order figure was \$420.9 million.

On shipments of machine tools,

the preliminary figures for August are \$36.45 million metal-cutting, \$10.7 million metal-forming, and \$47.15 million total. Except for the month of January 1960, it was the lowest rate of the year.

For comparison, July 1960 shipments have been finally valued at \$51.3 million total. A year ago (August 1959), shipments totaled \$40.3 million.

Shipments in the first eight months of 1960, for both types of machine tools, came to \$435.85 million. In 1959, the total shipment figure for eight months was \$330.05 million.

In summary, it will be noted that net new orders this year, as recorded for eight months, are just \$15.5 million above last year (\$436.4 vs. \$420.9 million). That 1960 net orders (\$436.4 million) are pacing 1960 shipments (\$435.85 million). And that shipments this year (\$435.85 million) are considerably above last year's (eight months) shipments (\$330.05 million).

Around the Industry

Star Cutter Co.—has purchased the Baker Brothers, Inc., line of

August Machine Tool Orders Totaled \$57.55 Million—an Increase of 34 Per Cent Over July's Volume. Shipments This Year Are More Than \$100 Million Above Rate Last Year

keyseaters, profile grinders, and keyseater cutters, and will produce this equipment under the Star tradename at Farmington, Mich.

Fenway Machine Co., Inc.—has re-located its plant in larger quarters at 1910 N. Marshall St., Phila. 22, Pa.

E. W. Bliss Co.—Charles E. Peterson has been named division manager in charge of the Mackintosh-Hemphill Div. In this position he succeeds J. R. Patterson, who was recently elected president and chief executive officer of E. W. Bliss.

Gleason Works—Earl D. Damert has been made chief designer of the Universal Machine Group, concerned with machines such as gear generators and grinders. Herman A. Male has assumed the post of chief designer, Production Machine Group, centered on high-production units such as automatic-loading machines.

Ace Abrasive Laboratories, Inc.—James P. Kennedy has been appointed general sales manager of this maker of diamond wheels, hones and diamond compounds. ■

METAL CUTTING AND FORMING MACHINE TOOLS

Net New Order Receipts, and Shipments

(Millions of Dollars)

1960	Net New Orders			Shipments		
	Cutting	Forming	Totals	Cutting	Forming	Totals
Jan.	\$43.45	\$13.00	\$56.45	\$36.75	\$9.65	\$46.40
Feb.	47.70	12.90	60.60	40.00	11.95	51.95
Mar.	48.45	13.50	61.95	51.05	13.45	64.50
April	36.70	15.15	51.85	43.95	11.15	55.10
May	37.95	12.00	49.95	44.30	12.05	56.35
June	42.60	12.50	55.10	48.40	14.70	63.10
July	33.50	9.45	42.95	39.45	11.85	51.30
Aug.	49.45*	8.10*	57.55*	36.45*	10.70*	47.15*
8 Mos. '60	339.80*	96.60*	436.40*	340.35*	95.50*	435.85*

* Preliminary.

Source of Statistics: National Machine Tool Builders' Assn.

Preview of

THE 1960 PHILADELPHIA METAL SHOW



PHILADELPHIA TRADE AND
CONVENTION CENTER

OCTOBER 17-21

By C. J. Kelly
ASSISTANT EDITOR

11 PRODUCT CATEGORIES AT ASM SHOW

1. FERROUS METALS
2. NONFERROUS METALS
3. RELATED ENGINEERING MATERIALS
4. NUCLEAR MATERIALS and equipment
5. TOOL MATERIALS, CUTTING OFF and FORMING equipment
6. INDUSTRIAL HEATING equipment
7. CLEANING AND FINISHING equipment
8. WELDING AND JOINING equipment
9. TESTING, INSPECTION AND CONTROL equipment
10. METALS PRODUCTION AND CASTING equipment
11. PARTS, FORMS AND SHAPES for DESIGN and APPLICATION

A

NEW theme will be established by the American Society for Metals at the 42nd National Metal Exposition to be held in Philadelphia Oct. 17-21. The 25,000 visitors who are expected to attend the show will sense a new exhibitor content that results from the establishment of 11 product categories to which all displays have conformed.

These product qualifications were established following extensive personal interview research among visitors to earlier Metal Shows. Hundreds of registrants were asked what they wanted to see, and what type of exhibits would be most helpful to them.

As a result of these interviews, and of specific comments from members of the sponsoring American Society for Metals, the 11 product categories were made the basis of acceptance of exhibitor contracts for the event.

With nearly 300 exhibitors arrayed throughout the Philadelphia Trade and Convention Center, their common relationship to 11 metalworking categories will provide more product and service information on materials, processes, fabrication and inspection methods than ever before.

SPECIAL STEEL AREA

ONE of the focal areas of the 1960 Metal Show will be the dramatic theme tower in the Steel Arena. Made entirely of steel, this "quadrilon" will rise 34 ft above the exhibit floor carrying a huge steel sphere featuring the ASM seal and the Steel Arena theme, "Build It Better with America's Steel." The lounge area in the quadrilon will be the scene of ceremonies marking the formal opening of the Metal Show on Monday, October 17. It also will serve as headquarters during the week for technical, sales and marketing experts from the steel industry.

Grouped around the Theme Tower will be the largest array of steel firms ever assembled in a Metal Show including: Allegheny-Ludlum Steel Corp., Babcock & Wilcox Co., Braeburn Alloy Steel Corp., The Carpenter Steel Co., Crucible Steel Co. of America, Firth Sterling, Inc., Latrobe Steel Co. and Enamelstrip and Great Lakes Steel Divisions of National Steel Corp. Others are Republic Steel Corp., Timken Steel and Tube Div. of Timken Roller Bearing Co., Ulbrich Stainless Steels, Inc., Universal-Cyclops Steel Co., Vanadium-Alloys Steel Co., and Washington Steel Corp.

Joining with the steel companies are two firms planning exhibits advancing the broad uses of steel: International Nickel Co. and Vanadium Corporation of America.

(Turn to page 109, please)

What's NEW at the

42nd

1960 NATIONAL METAL SHOW

Proportioning System

A complete new proportioning system, known as the Hydra-Cat, has been designed to pump, meter, transfer, mix and dispense two component, chemically reactive materials. It em-

ploys a pneumatic power unit to pump the two materials, proportion them in continuous metered accuracy, filter them, and power their transfer through separate flexible hoses to a lightweight mixing and dispensing

PHILADELPHIA
OCTOBER 17-21

By C. J. Kelly
ASSISTANT EDITOR

gun. The materials are then pre-blended, homogenized into a final, intimate mix, and applied by airless spray.

The pneumatic power unit maintains continuous proportion accuracy under all conditions of transfer and dispensing through its balanced design, positive displacement, and reciprocating action. Pre-determined selection of cylinder assemblies provides 13 mix ratios ranging from 1:1 to 4:1. The pump will stall out against pressure, insuring instantaneous control, and eliminating the need for auxiliary control circuits, bypasses, or power engagement devices. Materials are completely sealed and protected from contamination.



Have you ever attended a Lamb Electric MOTOR CONFERENCE?

If you are planning a new product that will require a Special Fractional Horsepower motor . . . a Lamb District Engineer will set up a "Personalized Motor Conference", just for you.

Result: The RIGHT MOTOR produced at the most favorable cost.



THE LAMB ELECTRIC COMPANY
KENT, OHIO

A Division of American Machine and Metals, Inc.
In Canada: Lamb Electric
Division of Sangamo Company Ltd. — Leaside, Ontario

Lamb Electric
SPECIAL APPLICATION
FRACTIONAL HORSEPOWER MOTORS

Divisions of American Machine and Metals, Inc., New York 7, New York TROY LAUNDRY MACHINERY • RIEHLE TESTING MACHINES • DE BOHEZAT FANS • TOLHURST CENTRIFUGALS • FILTRATION ENGINEERS • FILTRATION FABRICS • NIAGARA FILTERS • UNITED STATES GAUGE • RAHM INSTRUMENTS • LAMB ELECTRIC CO. • HUNTER SPRING CO. • GLASER-STEERS CORP.



Separation of materials until moment of dispensing eliminates the possibility of premature setting. Material mix is initiated within a static labyrinth blending chamber. At moment of dispensing, materials are homogenized into a final mix by forcing the blend through a small orifice at extremely high pressure without the use of atomizing air. Overspray is held at an absolute minimum to provide compounded savings in time and materials. Solvent control system permits instantaneous, thorough purging of materials when desired. Gray Co., Inc. Booth 1719

Circle 30 on postcard for more data

(Turn to page 96, please)

DOT.[®] NYLON PUSH-IN NUT

- Non-corroding
- Electrical insulator
- High pull-out resistance
- Straight legs won't distort thin, soft materials

This versatile fastening device snaps into place under finger pressure alone. Its straight legs permit easy insertion in square, punched holes while the tapered screw hole forces the legs apart when screw is inserted and ensures maximum pull-out resistance. Burrs do not impede the nut or prevent proper seating.

Ideal for use in virtually any type of thin-walled structure of sheet metal or plastic, the DOT Push-in Nut does not chip enamel surfaces, locks tightly without distorting the edges of the hole, resists vibration and serves as an excellent electrical and thermal insulator.

Suitable for use with #8 or #10 screws... locks in holes from .275" to .292" square... application thickness range: .030" to .060". Spacer type available with $\frac{1}{2}$ " dia. head from $\frac{1}{8}$ " to $1\frac{1}{2}$ " length in increments of $\frac{3}{32}$ ". Other types available in various sizes, round or square-headed, from $\frac{1}{32}$ " to $\frac{1}{8}$ " thick.

Engineering details and price information available on request.

CARR FASTENER COMPANY

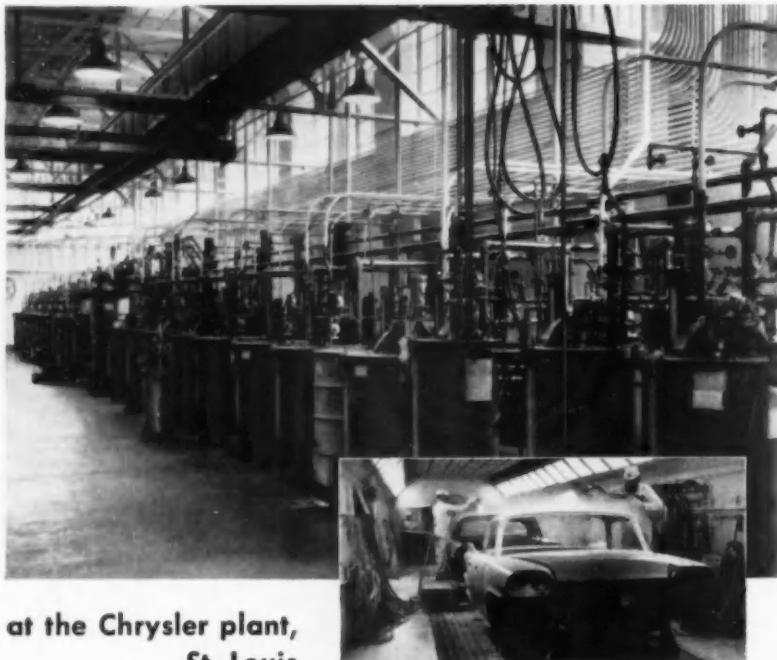
Division of UNITED-CARR FASTENER CORPORATION

Cambridge 42, Mass.



Offices in: Atlanta, Boston, Chicago,
Cleveland, Dallas, Detroit, Kalamazoo,
Los Angeles, Louisville, New York,
Philadelphia, Syracuse





at the Chrysler plant,
St. Louis

Binks circulating system gives instant 24-color selection

In Chrysler's highly automated assembly plant in St. Louis, body units are channeled through spray booths at a rate of 960 per day. Chryslers, Valiants, Plymouths and Dodge Darts come through in any sequence and color changes are made almost from car to car. Spray operators must switch colors fast to keep production flowing.

Binks paint circulating system and spray guns make it easy to keep up with the fast moving line. With quick detachable fluid connectors, spray operators hook into any one of 24 colors in seconds. Fluid pressure in the system is automatically kept constant regardless of how many guns are in use.

Chrysler chose a Binks system for a very good reason . . . a similar system had already proved itself in their Evansville, Indiana plant. Although it is a custom installation the majority of units and accessories used are standard production items . . . an important factor in keeping costs down.

Send for bulletin today If you'd like to know how Binks circulating systems and spray equipment can economically automate your production lines . . . write today for Bulletin 701.



Ask about our spray painting school
Open to all...NO TUITION...covers all phases



SPRAY
GUNS



AIR
COMPRESSORS



NATIONWIDE
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What's NEW at the

NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 94)

Ultrasonic Instrument

A fully transistorized battery-powered Sonizon SO-300 will be demonstrated. This direct-reading unit measures thickness from one side only, of steel, cast iron, brass, nickel, aluminum, hard plastics, and every other material which transmits ultrasonic sound. By placing a probe on the surface of the piece to be measured and rotating a dial, the unit gives an instantaneous reading of thickness.

Improved features include a rugged chassis, greater sensitivity, and easier read-out. Accuracy better than ± 1 pet when checked against known sample. Measuring unit weighs 12½ lbs.



Also displays for materials engineering and development, will be the Magnatest FM-500 Elastomat which is reported to accurately determine the dynamic modulus of elasticity, shear modulus, Poisson's ratio, and the damping factor of either metallic or non-metallic materials. Rapid measurements can be made at temperatures up to 1800 deg F. Corrosion studies of effect on materials are also carried out. A feed-back transducer system facilitates self-excitation of the test specimen. Readout of numerical data is obtained from an integrated electronic counter.

Several completely new water and oil suspendible materials for visible and fluorescent magnetic particle testing will be introduced. All are in the new convenient powder form, and incorporate features of easier mixing; handling and storage; increased fluorescent brilliance from 70 pet to 600 pet; closely controlled particle size range; less foaming, and more corrosion protection. Magnaflux Corp. Booth 1520

(Turn to page 98, please)



give the gentleman what he wants...

CAPACITY...
the complete
package

CAPACITY to keep the GENTLEMAN knee deep in OEM piston rings... if he wants them that fast! CAPACITY to manufacture the new ring designs that are constantly coming off the boards. Capacity to create the new machinery so essential to the manufacture of these new rings... at higher speeds, greater precision, lower costs. Yes, that is the kind of Capacity that we have at THOMPSON PRODUCTS RAMCO... the kind we know will GIVE THE GENTLEMAN WHAT HE WANTS...

Right now... most car factories and engine builders have T. P. RAMCO rings on test. May we tell you more about T. P. RAMCO Capacity? New Ring Designs? We'd like to very much.

Piston Rings by THOMPSON PRODUCTS RAMCO DIVISION



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VALVE DIVISION

THOMPSON PRODUCTS
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THOMPSON PRODUCTS
MOTOR EQUIPMENT,
MANUFACTURING DIVISION

Circle 142 on Inquiry Card for more data

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What's NEW at the

NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 96)

Aluminum Flux

Developed specifically for the field of aluminum fabrication, a new soldering flux has been developed for soldering aluminum with soft solders. Named LA-CO, this flux does not require any special soldering technique.

The manufacturer claims that it makes a finished joint or seam which is as strong as the tensile strength of the solder itself.

According to the manufacturer this flux penetrates into the tiniest crevice by capillary action, and cleans the surface so effectively the two metals literally bond together.

LA-CO aluminum flux is available in paste form, packed in large volume containers for production use. *Lake Chemical Co. Booth 1450*

Circle 32 on postcard for more data

Cobalt Radiography Cameras

A new, inexpensive line of cobalt 60 radiography cameras will be displayed at the Metal Show.

The machines in this line were designed for the many metal fabricating operations that require a rigid quality control system, non-destructive testing and inspection.

This family of 5 model 60 machines have capacities of 1, 5, 10, 30 and 100 curies of cobalt 60 respectively, with weights ranging from 190 to 1,100 lbs. They are designed primarily for panoramic and internal radiography, where the machine is used to position the source as required. Prices range from \$1,900 to \$3,500.

All of the units may be obtained with provisions for containing and using more than one radioactive source. In this fashion, the operator has a choice between a stronger or a weaker cobalt 60 source, or between a cobalt 60 source and an iridium 192 source. The multiple units are really two or three machines in one, and the cost of the extra source positions is far less than that of additional cameras.

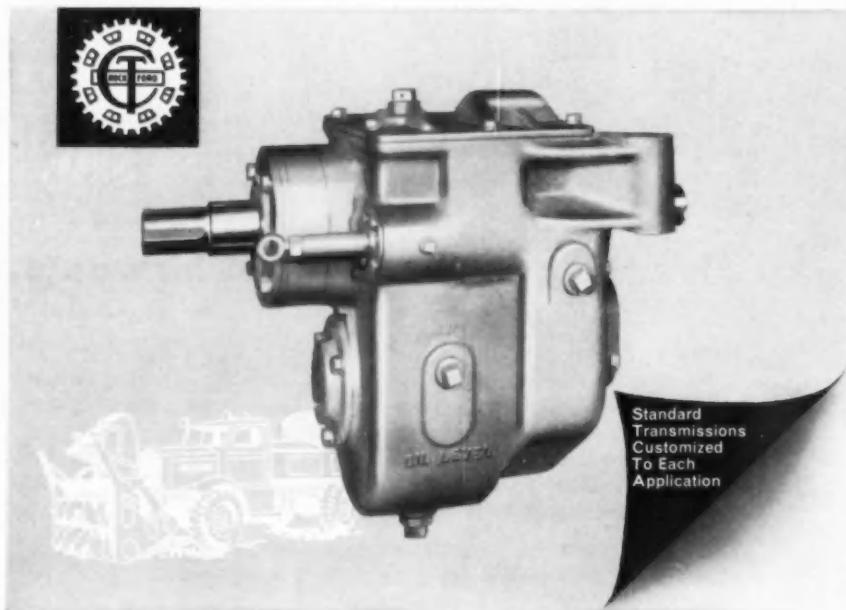


Cobalt 60 is useful in radiographing from $\frac{1}{4}$ to over 12 in. of steel. Iridium 192 has a range of from $\frac{1}{4}$ to 3 in. of steel. Thus, a model 60 unit with both iridium 192 and cobalt 60 sources offers a radiographic capacity of from $\frac{1}{4}$ to over 12 in. of steel thickness.

The model 60-1 through 60-100 cameras are mounted on pneumatic-tired wheels and are provided with handles for movement to the unit which is to be inspected. *Radionics Inc. Booth 1539*

Circle 33 on postcard for more data
(Turn to page 102, please)

Add "creep" control with Cotta auxiliary transmissions!



COTTA
HEAVY-DUTY TRANSMISSIONS



COTTA TRANSMISSION CO., ROCKFORD, ILLINOIS

Monautronic V-2 welding control certifies weld quality... cuts rejects and production costs

A resistance welding control that automatically compensates for every process variable



The new Monautronic V-2 welding control introduces the concept of feedback control to produce spot-welds of consistently high quality. It makes use of the latest advances in electronic computing to overcome automatically such obstacles to weld quality as line voltage fluctuation, electrode wear, variations in electrode tip force, surface finish and shunting.

The Monautronic V-2 compensates for undesirable variations usually encountered in resistance welding by maintaining voltage across a weld at a constant value. This constraint of voltage amounts to constraint of final weld temperatures, and such temperature control assures production of quality welds.

- **Automatic lockout**—occurs when process variations are so severe that the available current range would not cover the requirements for quality welding. The control detects extreme contamination, failure in the force system, overwelding, poor matching or fitup, and any other conditions that would result in sub-standard welds.

- **Automatic sequencing**—all provisions for single spot, roll spot or seam welding. Sequencing is 100% accurate, and exceeds NEMA standard specification 3B. Special sequence programming is available.

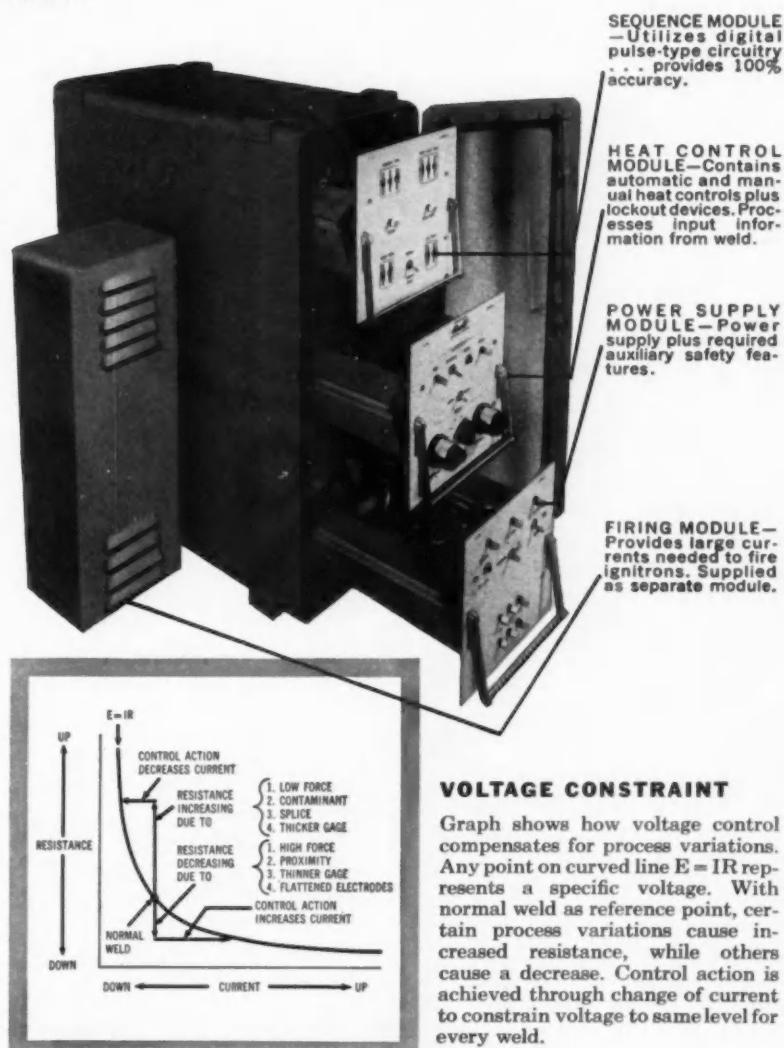
- **Transistorized design**—for high reliability, compactness, low power consumption.

- **Modular construction**—permits easy removal of the three modules and separate firing unit, simplifies maintenance.

- **Shock and vibration resistant construction**—for long, reliable service in even the most demanding applications.

- **Safety interlock**—for protection of personnel during tip dressing.

- **Temperproof case**—prevents access to control by unauthorized personnel.

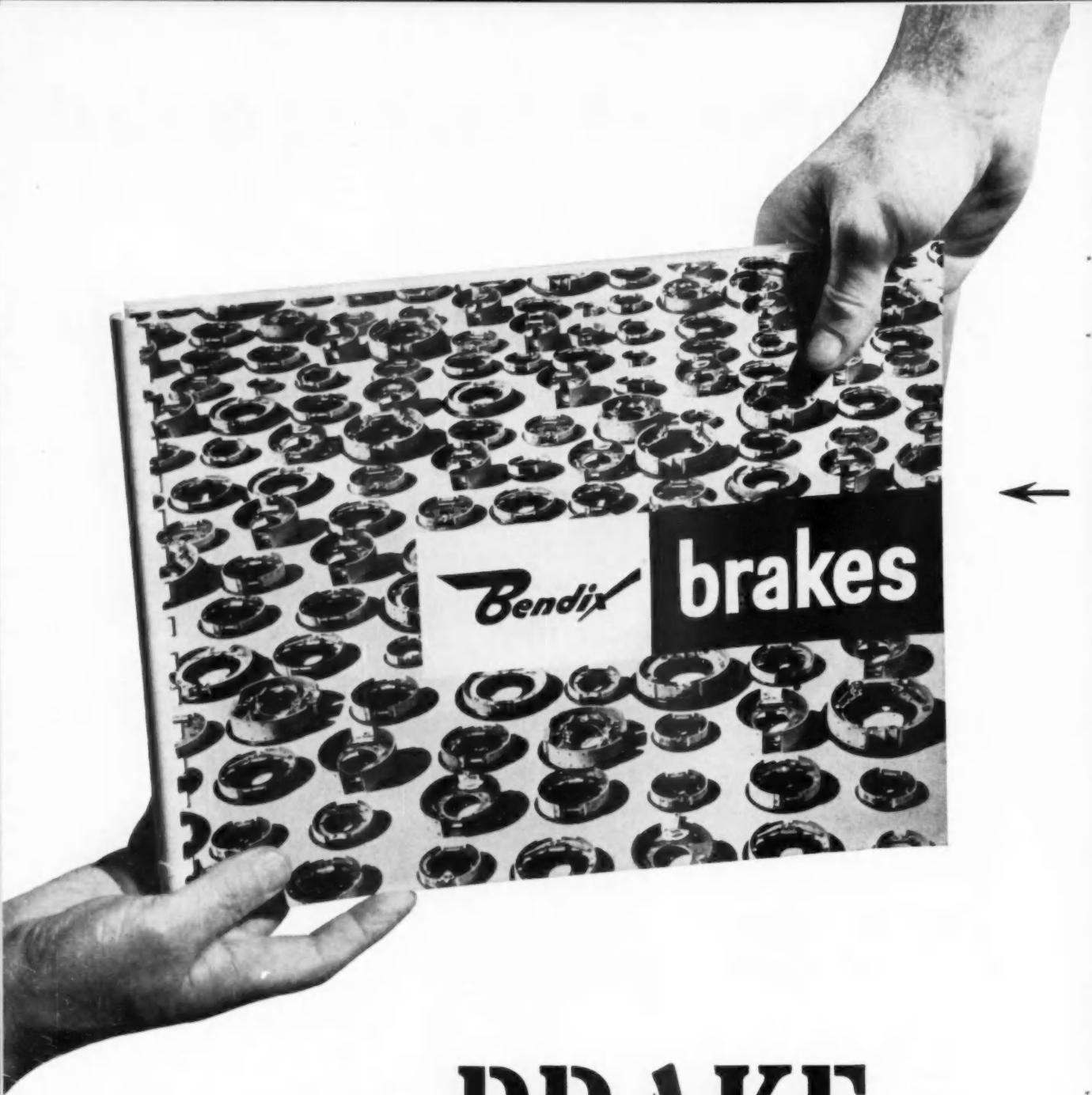


VOLTAGE CONSTRAINT

Graph shows how voltage control compensates for process variations. Any point on curved line $E = IR$ represents a specific voltage. With normal weld as reference point, certain process variations cause increased resistance, while others cause a decrease. Control action is achieved through change of current to constrain voltage to same level for every weld.

for complete details contact: THE BUDD COMPANY
Electronic Controls Section • Philadelphia 32, Pa.

ELECTRONIC
CONTROLS



**BRAKE
ENGINEERS:**

GET YOUR FREE COPY OF THIS AUTHORITATIVE, NEW 82-PAGE BRAKE CATALOG

Brand-new from Bendix—brake headquarters of the world—this valuable, *free* reference book for brake engineers! The book's 82 pages distill 40 years of Bendix brake experience and discuss the engineering features of:

- Duo-Servo® and non-servo hydraulic and mechanical brakes.
- Twinplex® and uni-servo hydraulic brakes.
- Auxiliary mechanical brakes.
- New band-disc brake.

Brake engineers will appreciate the logical arrangement of vital data on sizes, loads, torque capacities, and lining area, as well as complete installation information. You can depend on this data from Bendix engineers, who have developed more brakes for all types of vehicles and for other applications than anyone else in the world—supply is limited—send for your free copy now.

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Shows brakes for virtually all applications



Gives complete axle load rating data



Details brake torque capacity ratings



Provides installation data

Bendix PRODUCTS DIVISION South Bend, IND.



FILL OUT AND MAIL COUPON TODAY!



Automotive Brake Department,
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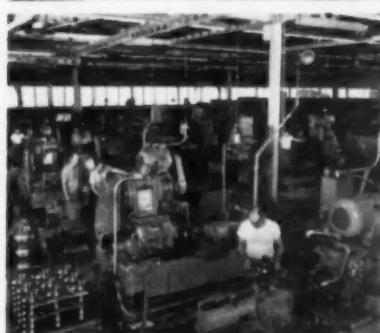
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"PROGRAMMED PRODUCTION"



...high productivity

AT **FAIRFIELD** benefits users of gears

Simple arithmetic explains why, TODAY, many of America's leading machine makers no longer undertake to solve the problems involved in production of gears, differentials, and specially designed gear parts. For them, FAIRFIELD IS THE ANSWER!

Every facility is available at Fairfield—latest, cost-cutting, ultra-modern metalworking and heat treating equipment, kept busy by volume production, plus expert engineering counsel. This makes for ECONOMY and EFFICIENCY that can BENEFIT YOU.

Check with Fairfield NOW on your gear production schedules. As one of the nation's largest independent producers, Fairfield can usually give you quickest service available and handle any production requirement. *Become a Fairfield customer; it pays! CALL OR WRITE.*

FAIRFIELD MANUFACTURING CO., INC.

2303 South Concord Rd. • Lafayette, Indiana



Gears and Differentials

for **FINE GEAR**

Made to Order for:

TRACTORS • HEAVY DUTY TRUCKS • AGRICULTURAL MACHINERY • POWER SHOVELS AND CRANES
MINING MACHINES • ROAD GRADERS • BUSES • STREET SWEEPERS • INDUSTRIAL LIFT TRUCKS

What's NEW at the

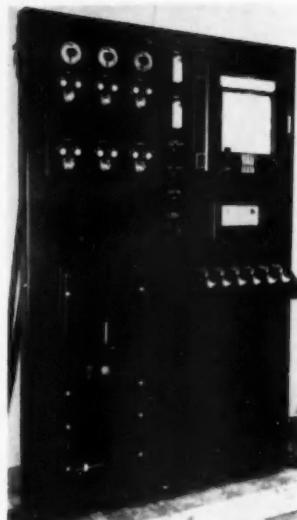
NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 98)
Multi-Control System

A new infrared multi-control system for heat treating atmospheres will be featured in an operating demonstration.

The system combines measurement and control of any one of three gas compounds—CO, CO₂ or CH₄—in one system. Each system may be calibrated for any one of these three significant gas compounds and, from sampling probes located anywhere in a heat treat, can control from two to six generators, batch furnaces or zones of continuous furnaces—or a combination of all three.



It is a completely assembled package with instruments, analyzer cabinet and all necessary "hardware" panel-mounted, piped and wired.

Another feature of the L&N exhibit will be an operating temperature uniformity test based on government aircraft specifications. The test will be conducted in a high temperature homo tempering furnace with thermocouples located throughout the load. A multi-point speedomax G recorder will measure and record the thermocouple temperatures. A new multiple point speedomax H indicator will be mounted adjacent to the speedomax G so that spectators may manually check any desired point. *Leeds & Northrup Co. Booth 1815*

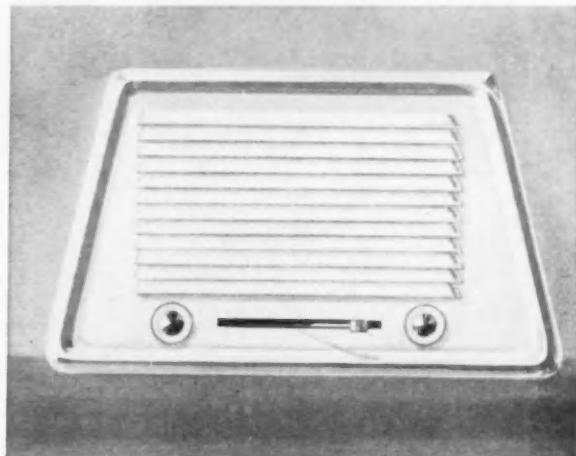
Circle 34 on postcard for more data
(Turn to page 104, please)



No Fugitive Plasticizers! Seat covers made of Escon polypropylene monofilaments do not emit fugitive plasticizers to fog windshields like many other synthetic upholsteries. In addition, these seat covers hold their shape as well as color...won't fade or bunch with repeated use. Other Escon properties include excellent impermeability to odor; good chemical and abrasion resistance; low density for more yardage per pound; and high tensile strength.



Sparks Cost Cuts! Escon exhibits high dielectric strength at all frequencies measured...provides a generous volume yield...allows finest detail in mold design. This makes Escon ideal for distributor caps, cable connectors and other under-the-hood parts.



Pure Punch Resistance! Some grades of Escon possess greater impact strength and hardness than many other thermoplastics...desirable properties in such items as air-conditioning grilles, heater grids, knobs and closures. Fast production cycles with Escon are another plus value.

ESCON[®] POLYPROPYLENE

versatile thermoplastic for tomorrow's cars

The automotive engineer will benefit greatly from Escon since it exhibits heat resistance up to 250°F., and shows resistance to oils, acids and solvents.

From every angle, Escon promises exceptional benefits. It offers manufacturers big economy because polypropylene's low density allows

more pieces per pound. It offers car owners new comfort and safety features plus new beauty in design.

For complete information, contact the nearest Enjay office! *Home Office:* 15 West 51st Street, New York 19, New York. *Other Offices:* Akron • Boston • Charlotte

Chicago • Detroit • Houston
Los Angeles • New Orleans
Plainfield, N. J. • Tulsa

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY

AUTOMOTIVE INDUSTRIES, October 15, 1960

Circle 147 on Inquiry Card for more data



What's NEW at the

NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 102)

Tensile Testing Machine

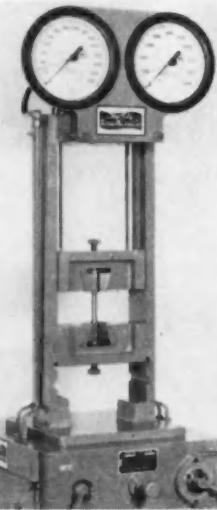
Compact, tensile testing machines having capacities up to 40,000 lb will be exhibited at the show. These ver-

tical, floor-mounted, motorized tensile testers are hydraulically operated, with the hydraulic system located within the base of the machine.

Stroke of the tensile testers is four in., and specimens up to 10 in. long by two in. wide can be accommodated. To compensate for various specimen lengths, the lower jaw holder can be inserted in any of three pairs of slots in the side rails. Different size and style jaws can be inserted or removed from the wedge-type jaw holders. One set of standard jaws, either flat or round, is furnished with each tester. Standard jaw capacities are 0 to 5

in. or $\frac{1}{8}$ to $\frac{1}{2}$ in. for flat specimens; and $\frac{1}{8}$ to $\frac{1}{4}$ in., $\frac{1}{4}$ to $\frac{1}{2}$ in., or $\frac{1}{2}$ to $\frac{3}{4}$ in. for round specimens.

A pair of compression plates is supplied for compression testing. The upper platen is six in. square, and the lower platen is six in. diam. plate, which replaces the adjusting screw on the upper jaw holder. The compression testing area will accommodate specimens up to $4\frac{3}{4}$ in. high and seven in. wide.



HANSEN

SERIES HWY QUICK-CONNECTIVE
TWO-WAY SHUT-OFF
COUPLINGS

**QUICK
CONNECTION**
with instant
automatic flow

**QUICK
DISCONNECTION**
with instant automatic shut-off
...prevents loss of liquid, gas, or pressure

To connect a Hansen Two-Way Shut-Off Coupling, you merely pull back the sleeve and push the Plug into the Socket. To disconnect, just pull back the sleeve. No tools required. When Coupling is disconnected, similar valves in Socket and Plug shut off both ends of line—practically eliminating spilling of liquid or escape of gas at instant of disconnection.

**Available in brass or steel, with female pipe
thread connections from $\frac{1}{8}$ " to $1\frac{1}{2}$ " inclusive.**

Representatives in Principal Cities
See Yellow Pages

SINCE 1915

QUICK-CONNECTIVE FLUID LINE COUPLINGS

THE HANSEN

MANUFACTURING COMPANY

4031 WEST 150TH STREET • CLEVELAND 35, OHIO

Write for the
Hansen Catalog

Here is an always ready reference when you want information on couplings in a hurry. Lists complete range of sizes and types of Hansen One-Way Shut-Off, Two-Way Shut-Off, and Straight-Through Couplings—including Special Service Couplings for LP-Gas, Steam, Oxygen, Acetylene, etc.

Heat Treating Furnace

Designed for "Automotion" a new furnace and quenching tank will be exhibited at the Metal Show. The manufacturer points out that an interesting feature of this continuous production heat treating equipment is that processing uniformity is assured because the parts are kept in motion during heating and quenching. Motion of the parts in the furnace retort assures each part receiving the same heat and exposure to the atmosphere as every other part.

According to the report the movement of parts during processing is of specific advantage in carburizing and case hardening—especially light case work—because it eliminates point

(Turn to page 106, please)

104

Circle 148 on Inquiry Card for more data

AUTOMOTIVE INDUSTRIES, October 15, 1960

(Inland "job-tailored" Cold Rolled Sheets)



FORMABILITY

Like the supple bending . . . the creation of new shapes and forms by this highly-trained dancer . . . steel, too, must be endowed with similar ability . . . FORMABILITY. If it is to meet the varied needs of today's manufacturing practices, steel must be produced for ease of fabrication . . . must form dependably without springback or surface disturbances.

FORMABILITY, as a working characteristic, is carefully built into Inland Cold Rolled Sheets. Prime consideration is the use for which the steel is ordered. Inland makes certain it *knows* its customer's requirements . . . works always to satisfy such specific needs.



In Yoder forming and tangent bending of refrigerator wrappers, Inland Cold Rolled Sheets do not flute (panel) or spring back.



Television cabinet wrappers are not marred by surface disturbances even though Inland Sheets are brake press formed on fast assembly lines.



Projection screen cases are produced with Inland Sheets without time-wasting spring-back and with no fluting to mar attractive appearance.



INLAND STEEL

30 West Monroe St., Chicago 3, Ill.

Sales Offices: Chicago • Davenport • Detroit
Houston • Indianapolis • Kansas City • Milwaukee
• New York • St. Louis • St. Paul

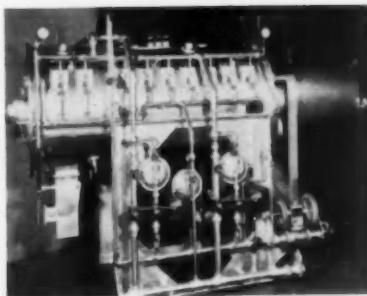
What's NEW at the

NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 104)

of contact case variation caused by continuous contact between the surfaces of stationary or nesting work pieces and between the work pieces



and conveying mechanism.

The furnace installation has a built-in continuous feeder so conveyor and



HAULING PROFITS UP with Rockford Spring-Loaded Clutches

Rockford Clutch equipped trucks move thousands of tons of limestone per day in construction and quarrying work. Here, higher power means higher profits. That's exactly what you get with Rockford Spring-Loaded Clutches — positive, full-motion driving power with cushioned starts and controllability. These rugged clutches are also used on haulers, loaders, graders, tractors and other vehicles where the clutch is in constant use. Write today for illustrated brochure.



ROCKFORD
SPRING-LOADED
CLUTCH

ROCKFORD CLUTCHES

ROCKFORD CLUTCH DIVISION



BORG-WARNER

315 CATHERINE ST.
ROCKFORD, ILLINOIS

Export Sales
Borg-Warner International
36 So. Wabash, Chicago, Ill.

other conveying devices are eliminated. The furnace and quenching tank utilizes a spiral which is an integral part of the furnace retort and quenching drum to convey the work through the heat and quench.

The compact model 136-MGE to be exhibited at the show has a production heat treating capacity of approximately 250 lbs per hour. *American Gas Furnace Co. Booth 1910-B*

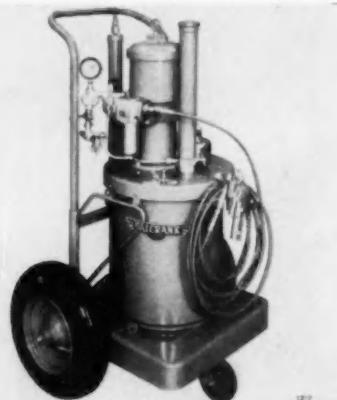
Circle 36 on postcard for more data

Paint Spray Units

These airless paint spray units offer a new method for paint spraying without air atomization or the use of heat. They create, with high fluid pressure, fine fan type or round type sprays of desired widths by using Tungsten carbide spray tips with various size orifices and spray angles.

Fluid pressure ranges from 1000 to 2000 psi using air pressure from 50 to 95 lbs. No electrical connections are required and there is no pressure on paint container or tank. Two spray guns, if desired, can be operated from one pump using up to 75 ft of material hose per gun.

Named "Hy-Spray," these units are



available in various size models to accommodate either five or 10 gallon original paint containers or up to 10 gallons of bulk paint, and 55 gallon original shipping drums where more capacity is required.

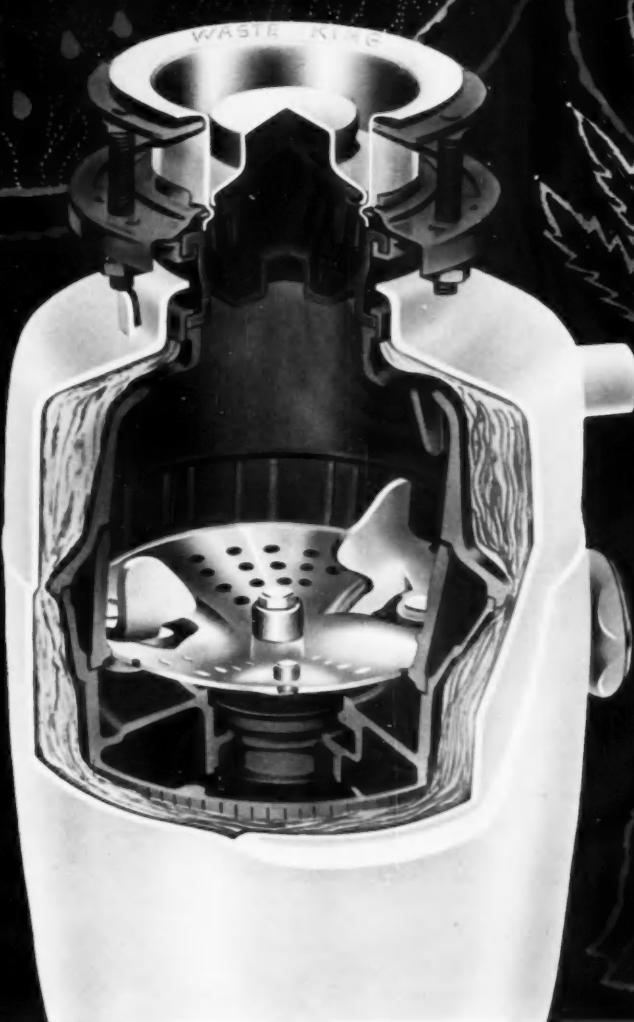
Ideal for both inside and outside spraying.

The "Hy-Spray" airless spray unit has a 22 to 1 ratio delivering fluid pressures 22 times the air pressure used. Double acting pump gives equal pressure and volume on both strokes. Divided type construction prevents paint from getting into air cylinder, fouling pump, or leaking paint on top of drum cover. *Balcrank, Inc. Booth 1266*

Circle 37 on postcard for more data

(Turn to page 124, please)

For the most severe functional application in the home



Superior Stainless



DOES A 365-DAY-A-YEAR JOB

Extremes of acid and alkali conditions—nearly constant corrosive action—intense abrasion! These everyday hazards are combatted successfully year after year in the *Waste King Universal Food Disposer*, thanks to functional elements of Superior Stainless Strip Steel. • Always uniform in performance and fabricating behavior, Superior Stainless is ever-bright, strong, and durable . . . furnished in the precise compositions, tempers and finishes you specify. • We have much to offer in technical assistance. *Use our experience!*

Durable and sanitary stainless is used for Closure Top, Sink Flange, Centrifuge Table, Impellers, Cutter Blades, Rivets for Impellers and Cutter Blades.



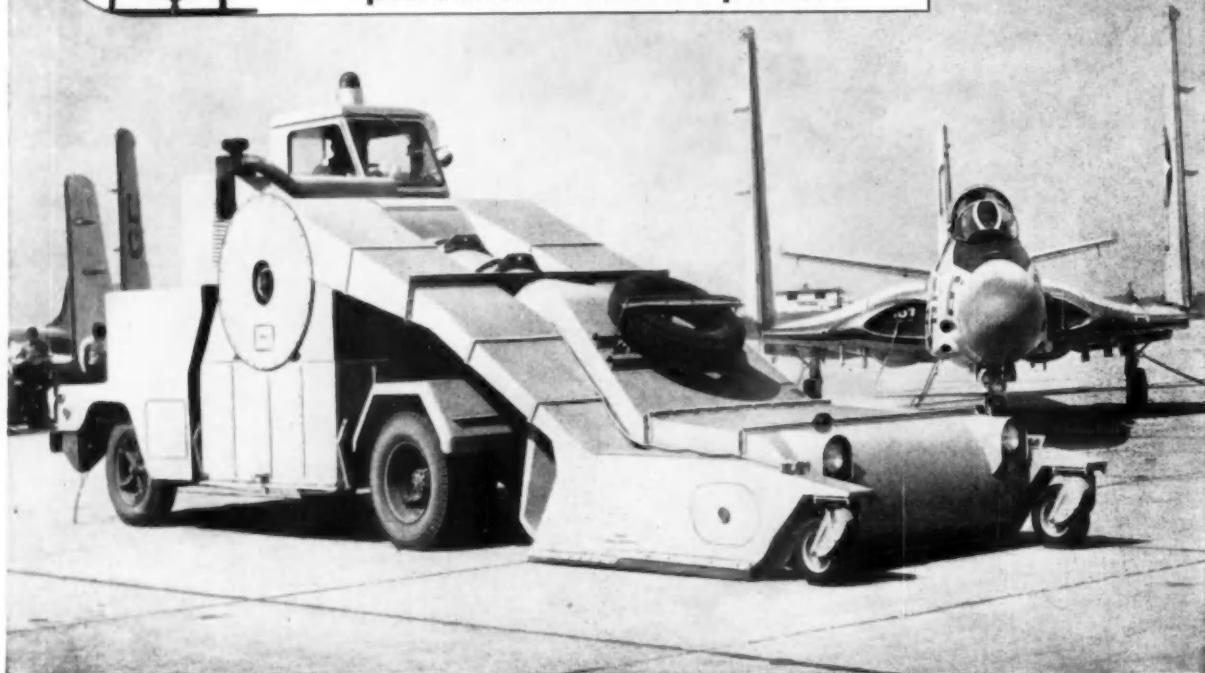
SUPERIOR STEEL DIVISION

OF
COPPERWELD STEEL COMPANY
CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York



**AGAIN . . . Ford Industrial Engines
are selected for outstanding
performance and compactness**



Leading OEM powers GIANT VACUUM CLEANER with FORD INDUSTRIAL ENGINES

PROBLEM: How to keep airports free of dirt and debris that cause tremendous damage when "sucked up" by powerful jet engines.

SOLUTION: Use Consolidated Diesel Electric's Model 2095 Vacuum Sweeper shown above!

Powered by two modern Ford Industrial Engines, the Consolidated Sweeper is designed to clean one million feet of runway per hour . . . picking up such debris as sand, gravel, wire, nuts and bolts. Just as Ford power contributes to the effectiveness of this unit, it can bring a new kind of efficiency to your equipment. Here's why:

Ford's full line of Short Stroke engines are compact, durable and economical to operate. Ford's space-saving construction and *high power-to-weight ratio* also give you a distinct manufacturing advantage: greater freedom of design.

Ford engines range from 134 to 534 cubic inches—including two highly efficient diesels. All are available as

FORD POWER IS RIGHT FOR YOUR EQUIPMENT, TOO!

INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.

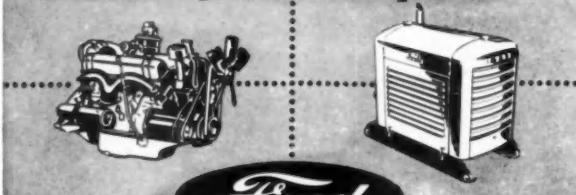
West of Rockies write to:

→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 6787, LOS ANGELES 22, CALIF.
→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 1666, RICHMOND, CALIF.

complete engine assemblies or power units. And, remember, because Ford engines can be serviced by any local Ford Dealer, your customers can get quick on-the-job service when they need it.

These are but a few of the important reasons why equipment designers, sales managers and top management are specifying Ford Industrial Engines. It will pay you to swing to Ford power if you haven't done so already.

More power to you...



Ford
INDUSTRIAL ENGINES
AND POWER UNITS

Preview of

THE 1960 PHILADELPHIA METAL SHOW

(Continued from page 93)

AUTOMOBILE COMPONENT DISPLAY

MANY steel-at-work demonstrations will be presented in the Steel Arena. One of the featured demonstrations will be the display of a 1961 Chevrolet Impala sport sedan, surrounded by the raw steel that is used in the manufacture of the automobile.

Included in this display will be cold rolled sheet, hot rolled sheet, hot rolled carbon bar, hot rolled alloy bar, stainless steel and hot rolled SAE 950, all identified as to type, methods of forming, processing and finishing. Partially finished parts will be used to demonstrate details of processing.

Such exhibits as these will focus attention dramatically on the quality that is built into the American car through advanced engineering information and sound knowledge provided by such educational events at the Metal Show.

METALLOGRAPHS OF STEEL

LEADING metallographers from throughout the world will present over 300 examples of their finest work in the American Society for Metals' Metallographic Exhibit.

They are actual photographs of the minute structure of materials

Show Hours

Monday, October 17

11:00 a.m.—Formal Opening Ceremonies
12 Noon Opening to 6:00 p.m. Closing

Tuesday, October 18

12 Noon Opening to 10:00 p.m. Closing

Wednesday, October 19

12 Noon Opening to 10:00 p.m. Closing

Thursday, October 20

10:00 a.m. Opening to 6:00 p.m. Closing

Friday, October 21

10:00 a.m. Opening to 6:00 p.m. Closing

as revealed by the microscope. Through electron microscopy, metallographs can be made of structures magnified upwards of 25,000 times their original size.

Entries in this year's contest will be judged in 14 separate classifications with "best of class" medals and blue ribbons awarded in each.

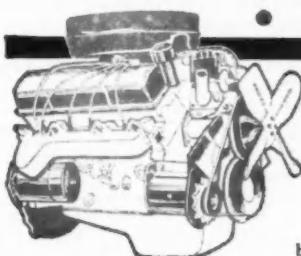
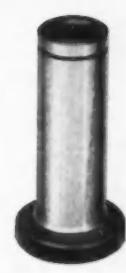
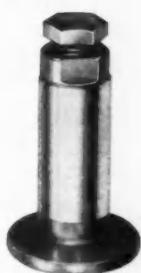
A.I.S.I. COOPERATION

AMERICAN SOCIETY for Metals acknowledged the cooperation of the American Iron and Steel Institute to further increase the usefulness of the 1960 Metal Show to steel users. Following discussions with American Iron and Steel

(Turn to page 112, please)

JOHNSON tappets

*



*for all engine applications

All of the engineering and manufacturing effort at Johnson Products goes into producing a better tappet. Continual experimentation and exacting quality control make JOHNSON TAPPETS worthy of your consideration. Only proven materials, covering a range of hardenable iron, steel, and chilled iron of various alloys, are used in JOHNSON TAPPETS. These tappets are successfully used in jobs ranging from light duty to the most severe, punishing applications. Serving all industry that employs internal combustion and diesel engines.



"tappets are our business"

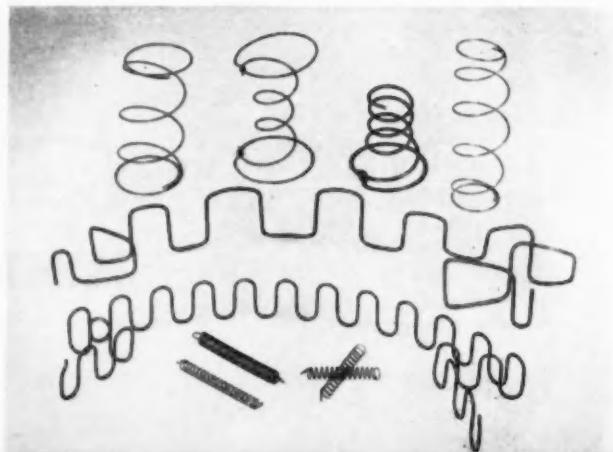
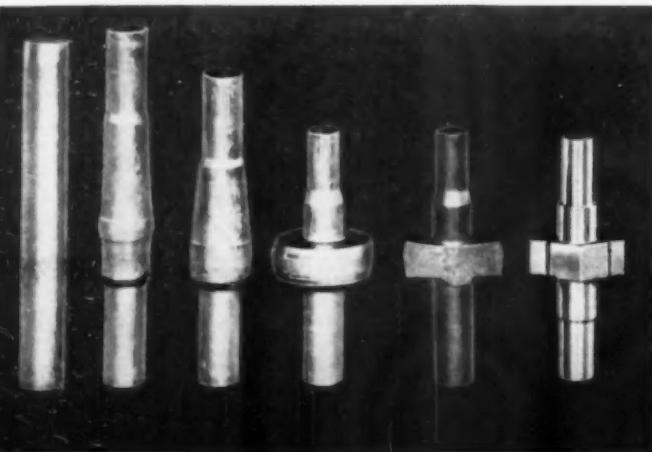
JOHNSON JP PRODUCTS
MUSKEGON, inc. MICHIGAN



Newest addition
to the
**REPUBLIC
FASTENER
FAMILY...**

GEAR PRODUCTION COSTS DROP. Producing parts, like the segment gear pictured, by cold heading, cold extrusion, and upsetting speeds production and reduces machining. Steel from Republic's new 11" bar mill in Chicago is specially suited for this purpose. Advanced features on the new mill assure your bar stock with highly uniform flow characteristics, precise dimensional accuracy, and improved physical properties. Send coupon for more information on Republic cold extrusion and cold heading quality steels. Photo courtesy of National Machinery Company, Tiffin, Ohio.

MEETING DESIGN REQUIREMENTS: Republic Steel Wire has the necessary strength, ductility, and toughness for difficult forming operations. Republic produces many types for virtually any application: Manufacturer's Coarse Wires; Spring Wires (Standard High Carbon and MB High Carbon); Screw, Rivet, and Heading Wires. Republic wire metallurgists are at your service—ready to provide obligation-free assistance in the selection, application, and processing of wire to best meet your requirements. Mail coupon for details.

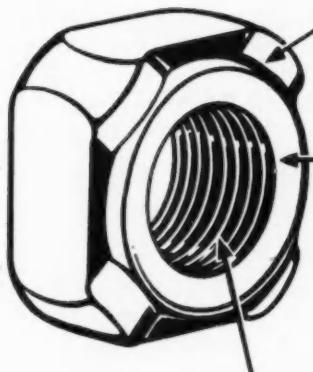


THE REPUBLIC MIDLAND WELD NUT

Providing you with the best fastener for every job . . . that's the objective of Republic's Bolt and Nut Division. Newest addition to the more than 20,000 different types and sizes of standard Republic Fasteners . . . the Republic Midland Weld Nut.

Originated and marketed by Midland-Ross Corporation, this top quality weld nut has been widely used for years by major manufacturers in many

COMPARE THESE FEATURES

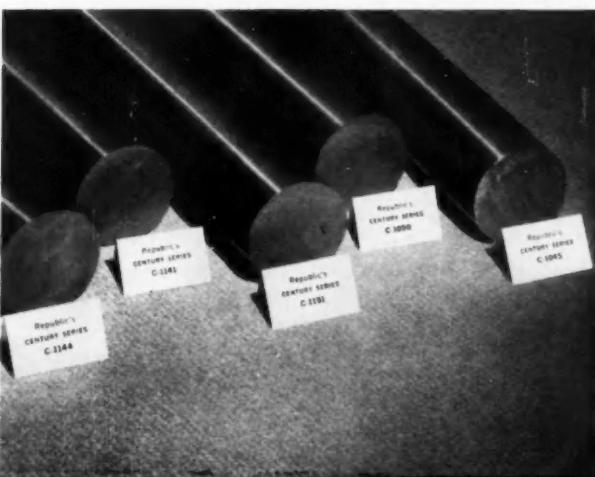


FOUR PROJECTIONS, rather than the three found on many competitive nuts, mean a more secure weld, assures level position, eliminates cross-threading.

CIRCULAR PILOT guides the nut rapidly and accurately into position, simplifies automatic feeding operations, protects threads from any possible weld spatter caused by improperly regulated welding equipment.

FULL DEPTH THREADING for maximum holding power. Close fitting unions anchor bolts for the life of the product, even under severe vibration.

PAY ONLY FOR THE MACHINABILITY YOU NEED. Smart way to trim material costs, and get just the degree of machinability and toughness you need . . . select from Republic's CENTURY SERIES high strength, stress relieved, cold finished steel bars. CENTURY SERIES bars are priced on a descending scale (as machinability decreases, price drops, too). Each of the five different grades has a minimum yield strength of 100,000 psi. Get complete information by sending the attached coupon for a free CENTURY SERIES booklet.



fields. Now, as a product of Republic Steel, it will continue to be made to the same high performance standards that have earned a reputation for consistent dependability.

PROVED DESIGN FEATURES mean fast, accurate positioning; more positive weld; sure holding power; and one man application makes this new Republic fastener ideal for the fabrication, fastening, or assembly of metal parts.

Republic Weld Nuts save time and money, solve many difficult design and assembly problems. Applied quickly and easily by any standard projection welding machine of proper capacity. For high speed operations, welding machines with automatic feeds are suggested. Mail the coupon for more data on the Republic Midland Weld Nut and its application for your products.



REPUBLIC STEEL

*World's Widest Range
of Standard Steels and Steel Products*

REPUBLIC STEEL CORPORATION

DEPT. AI-1228 1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

- Have a wire metallurgist call
- Please send more information on:
- Republic Midland Weld Nuts
- Cold Extrusion and Cold Heading Steels
- Wire CENTURY SERIES Cold Finished Bars

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Circle 154 on Inquiry Card for more data

H&K

perforated materials

a perfect medium of

DESIGN

with functional or
decorative uses

Harrington & King can perforate the proper design, pattern and open area in practically any metallic or non-metallic material available in coils, sheets or plates—from foil-thin to 1" thick. Specify H&K perforated materials on your next job.

Write for General Catalog No. 75, Today!

THE **Harrington & King**
PERFORATING CO.

Chicago Office and Warehouse • New York Office and Warehouse
5630 Fillmore Street 106 Liberty Street
Chicago 44, Illinois New York, New York

Circle 155 on Inquiry Card for more data

Wherever a product requires
the passage or control of

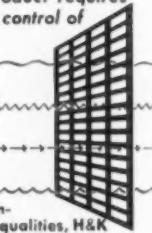
AIR

SOUND

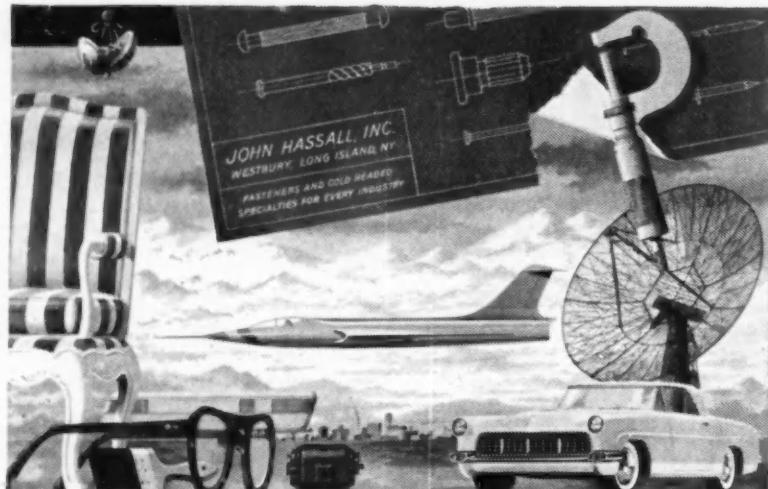
LIGHT

FLUID

or just for their in-
herent aesthetic qualities, H&K
perforated metals can serve you



Listed Under
"Perforated Metals"



Job-Designed Fasteners for Every Industry

Hassall Here is a fast, dependable, low cost, quality minded source of supply for JOB-DESIGNED fasteners of all types, in any metal, to fit your own assembly problem. Assembly costs are a very major part of manufacturing expense. Most of this is labor. The fastening medium itself is usually a minimum item. If a Job-Designed fastener makes assembly simpler and faster, permits the use of fewer fasteners, allows the designer functional freedom and improves product efficiency, yours is a specifying job well done. All these

possibilities are available when you come to Hassall for design assistance and quotation on challenging, difficult or unusual rivets, threaded nails, drive screws and other cold headed parts. Short or long runs, pilot quantities, engineering counsel, over 100 years of intimate association with cold heading—and a deep appreciation for the concept of value analysis—all are part of the Hassall service to you.

Send for a copy of our latest catalog.

JOHN HASSALL, INC.
MANUFACTURERS SINCE 1856
P.O. BOX 2194 • WESTBURY, LONG ISLAND, N.Y.

Circle 156 on Inquiry Card for more data

Preview of the

METAL SHOW

(Continued from page 109)

Institute, ASM managing director Allan Ray Putnam spelled out three areas where AISI has indicated willingness to provide assistance:

—Encouraging participation of steel industry experts to be in attendance at the Show, answering technical queries posed by Show visitors on the Exposition floor.

—Encouraging submission to the Metal Show, by steel producers and their customers, of exhibits showing new or novel uses of steel and steel alloys in products.

—Making available to the 1960 Metal Show the STEELMARK, symbol of modern steel products through modern American technology.

AISI participation will be limited to the Metal Show Steel Arena.

A.S.M. AWARDS

DR. CLARENCE ZEHNER, Director of Westinghouse Research Laboratories, Pittsburgh, has been chosen to deliver the American Society for Metals' most honored technical presentation—The Edward de Mille Campbell Memorial Lecture. Dr. Zehner will speak at 11:00 a.m., Wednesday, October 19, at the Bellevue Stratford Hotel.

The feature speaker at the 5th Annual Awards Luncheon of the American Society for Metals will be Edward G. Budd, Jr., President of the Budd Co. Mr. Budd will be awarded the Distinguished Life Membership in the American Society for Metals.

The featured address at The Annual Dinner of the American Society for Metals will be given by Tom C. Campbell, Editor in Chief of *Iron Age*. ■

(Now turn back to page 94 for descriptions of "What's New" Items exhibited at the Show)

Renault Cuts Prices

Prices in the U. S. of the Renault Dauphine sedan and Caravelle coupe have been cut from \$50 to \$171 in an effort to boost lagging sales of the imports.

ROILINE V8 for FIRE FIGHTING



The ROILINE H884 is a high compression, overhead valve engine with the advantages of *extra* speed and power. This flexible V-8 is designed for the instantaneous response and quick acceleration necessary to fire fighting equipment. The sturdy forged-steel crankshaft is short, due to V-8 compactness, with large diameter, wide surface bearing areas. The result is smooth operation with the least amount of vibration. The combination of V-8 design, sturdy, compact construction, and quick acceleration makes the ROILINE H884 engine a top performer.

Model H884

ADVANCED V-8 DESIGN
330 MAXIMUM HP.
884 CU. IN. DISPL.
DUAL IGNITION AVAILABLE
QUICK ACCELERATION
GOOD FUEL ECONOMY
LOW MAINTENANCE COST

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
 New York • Tulsa • Los Angeles

Factories: Waukesha, Wisconsin and Clinton, Iowa

501

Great names—that made
scientific filtration possible!



Liquid and gas filtration has been the specialty of Air-Maze for the last 35 years. Yet Boyle's 270 year old discoveries relating to the compression and expansion of air and other gases must be recognized and taken into consideration by our engineers in designing new equipment to keep modern machinery operating efficiently.

From diesel engines to jet aircraft . . . from lubricating oil filters to industrial pumps, filtration products by Air-Maze are keeping equipment running better and longer by keeping it clean and free of destructive contaminants.

The representative products shown below were designed and developed by Air-Maze engineers to solve highly specialized filtration problems. If your product involves any gas or liquid that moves, Air-Maze engineers can help you.



Typical of many breather-filters available for every vent and crankcase.

Vane type exhaust spark arrester. Meets U. S. Forestry Service Specifications.

OTHER AIR-MAZE PRODUCTS:
Air Filters • Liquid Filters • Intake
Silencers • Exhaust Spark Arresters
Breather Filters • Oil Mist Eliminators

AIR-MAZE
CLEVELAND 28, OHIO

A SUBSIDIARY OF ROCKWELL-STANDARD

Circle 158 on Inquiry Card for more data



Manufacturers' News

New Hercules Division

Hercules Motor Co. has formed a Special Products Div. for custom machining and engineering for outside concerns. Hercules has been awarded a large contract by a major automotive company. Joseph G. Rongitsch, assistant to the president, who will head the new unit, said it will handle volume production of engine heads, transmission housings and other engine components.

Ortman-Miller Representatives

Air Draulic Sales Co., 1390 Briarwood Drive, Memphis, Tenn., has been named representatives of Ortman-Miller Machine Co., Inc., in Western Tennessee, Arkansas, Mississippi and Louisiana.



New six-rib Silvertown silhouette is displayed by B. F. Goodrich technician who points out "re-location" of rubber on outside ribs of tire. This feature is designed to add 25 per cent mileage.

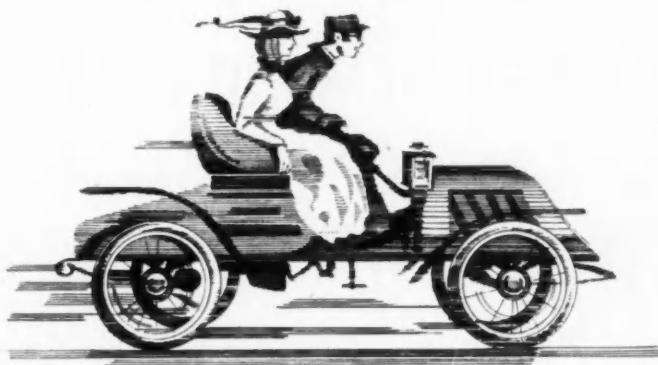
Process Speeds Reproduction of Prints

Engineers in the Control Switch Div. of Controls Co. of America have developed a process that insures high volume quality engineering prints. Peter Belopavlovich, assistant chief engineer, said the process speeds output of original drawings and prints 100 per cent and reduces reproduction costs by 50 per cent.

New Enameling Furnace Installed

A. O. Smith Corp. has placed in operation its 140-ft long Lindberg porcelain enameling furnace for firing glass coated "Harvestore" sections. It has a capacity of 24,000 lb gross and 13,500 lb net production per hour. The heating chamber is 75 ft long and is divided into six independent control zones.

(Turn to page 122 please)



“don’t worry, Bess . . . it’s made of steel”

Since the early automobile shows, people have had confidence in their cars because they were made of steel.

Carbon and Stainless steels have helped to build millions of automobiles, keep them running longer and make them better looking every year.

There is really no other metal like Steel for automobiles.



Look for the STEELMARK
on the products you buy.

McLOUTH STEEL CORPORATION

Detroit 17, Michigan

DOW

News about
**CHEMICALLY
ENGINEERED
PLASTICS**

Throughout the automotive industry, you'll find modern plastics at work. They contribute to the stylish, attractive appearance of car interiors. They simplify production. They even help achieve long life in the equipment used to make and service cars. The continuing development of plastics technology at Dow has provided automotive men with many ways to add to the performance and sales appeal of their product.

DOW PLASTICS MEET DEMAND FOR PERFORMANCE—AT LOW COST

Today's style-conscious, value-alert buyers place strong demands on a car's interior. Colorful good looks are a must! But over and above appearance, new-car buyers demand hard-wearing, abuse-taking upholstery that's easy to clean.

These many customer requirements are met fully with the help of vinyl fabrics made with Dow PVC . . .

Dow PVC (polyvinyl chloride) solves tough fabric problems involving both appearance and serviceability for seat upholstery, side panels and roof liners. With a vast array of colors and

color combinations possible, fabrics of Dow PVC can be supplied in any desired surface pattern . . . with the extra value of texture and feel that spell superb quality to the serious buyer and casual shopper alike.

Besides adding eye-appeal, these fabrics have excellent aging characteristics to assure the lasting value of durability. They are cleaned with a damp cloth . . . with warm water and



soap or other mild cleansing agent needed only for the most stubborn dirt spots.

Dow supplies PVC resins, with their excellent processing characteristics, to calenderers of fine interior fabrics that help sell cars—make them more enjoyable to own and drive.

Dow Latex 2582, for the underside

of automotive fabrics, makes possible even the lightest of colors. This, in turn, opens the door for high-styled fabric patterns with varied weaves, fleck designs and other creative ideas of automotive designers.

In addition, backing formulations made with Latex 2582 are highly resistant to stains—even copper and

other metallic dyes—as well as to fading and aging. Dow supplies Latex 2582 both to backing formulators and to fabric manufacturers.

While Dow PVC and Latex 2582 help provide more colorful, more serviceable fabrics, other Dow plastics products help car makers in other ways . . . such as in the examples below.

SOLVE TOUGH AIR CONDITIONING PROBLEMS WITH STYRON 440

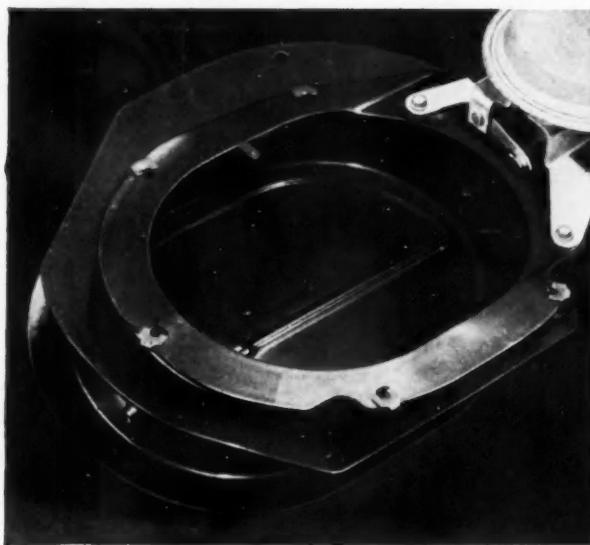
Air conditioning answer. Styron® 440 helps automotive engineers design better heating and air conditioning system parts. This rugged Dow thermoplastic cannot absorb or transmit water. Thus, no change of dimensions due to moisture, no deterioration. No distortion from the wide range of temperatures encountered in automobile operation, either. Parts made of Styron 440 keep their snug fit throughout their long

service life.

These parts are lightweight—much lighter than materials commonly used in such automotive applications. And they require no painting for protection or appearance's sake. The color—any color—is molded into the material. This means no unsightly paint chipping wherever parts are on view in the car interior.

Takes tough treatment. Styron 440

goes to the head of the class on the automotive production line, too. Its excellent moldability and fabrication characteristics cut manufacturing costs neatly. (Very few rejects, for example . . . almost none.) It's tough enough to withstand the knocks and bruises of assembly operations. Takes staples, self-tapping screws and other joining devices without a whimper, and keeps them in place on the roughest roads.



ETHOCEL: A "HELMET" FOR HEADLIGHT AIMERS!

The same material that has proved its toughness and stamina in helmets for pro football players also helps assure long life for equipment like this headlight aim. For rugged service, its cover is made of Ethocel®, which provides great toughness and high impact strength over wide temperature ranges.

Besides withstanding severe shock, Ethocel resists chemicals, yet provides dimensional stability to ensure perfect production line assembly of close tolerance parts. Ethocel has the additional advantage of an attractive, glossy surface that's easy to maintain.



For more information, for help in putting these materials and many other members of the Dow family of plastics to work profitably for you, call on Dow. We suggest you contact the nearest Dow sales office or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1710-T10-15.

THE DOW CHEMICAL COMPANY
Midland, Michigan



See "The Dow Hour of Great Mysteries" on TV

**DYKEM
STEEL BLUE®**

Stops Losses
making Dies and
Templates

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample
on company letterhead

THE DYKEM COMPANY
2301-L North 11th St. • St. Louis 6, Mo.

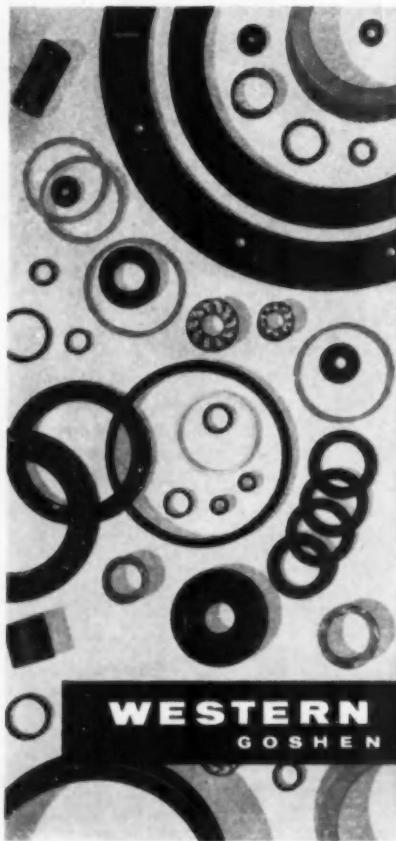
Circle 162 on Inquiry Card for more data

CUT SCRAPER TIME
END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

THE DYKEM CO., 2301-L NORTH 11TH ST., ST. LOUIS 6, MO.

Circle 161 on Inquiry Card for more data



Modern Facilities

For Lathe-Cut Rubber Parts

Trained technical and engineering personnel, a completely modern laboratory and 15,000 square feet of space containing stock storage, curing, grinding and cutting equipment.

Western Rubber offers you experience — more than 55 years of it — in the making of washers, gaskets, bushings and rings of almost limitless sizes and shapes...all custom designed and economically produced to your specifications.

Write or phone for information or a visit by our sales engineer in your area.

WESTERN RUBBER CO.
GOSHEN 6, INDIANA

MOLDED AND LATHE-CUT RUBBER
PARTS FOR ALL INDUSTRIES



118

Circle 163 on Inquiry Card for more data

NEW PRODUCTION EQUIPMENT

By C. J. Kelly
ASSISTANT EDITOR

Drill Press Table

NAMED the Palmgren 500, this all purpose drill press table, which fits all popular size bench or floor model drill presses, is now available. The table is quickly installed on the drill press column, and provides two cross slide movements together with 360 deg rotary feed and graduated tilting adjustment.

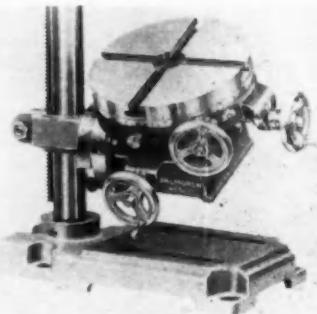


Table diam is 8 in. graduated 360 deg. Top surface has two $\frac{1}{8}$ in. by $1\frac{1}{2}$ in. T slots which cross at center. Transverse and longitudinal travel is $4\frac{1}{4}$ in., and cross feed dials are graduated into thousandths. Rotary feed is positive with worm gear ratio of 40 to 1. Rotary dial is calibrated in three minute intervals. Column mounting bracket is also graduated in degrees for angular tilting adjustment.

Take up adjustment is provided for wear in worm and gear, and both dovetail cross slides are furnished with adjustable gibbs to compensate for wear, and assure ease of travel to suit operation and material. The table assembly can be quickly and easily removed from the column mounting bracket. The base is machined and provided with bolt lugs for mounting to other machine tables. *Chicago Tool & Engineering Co.*

Circle 59 on postcard for more data

Dial Feeding Unit

THIS dial feeding unit is constructed to withstand necessary stamping pressure. It may be mounted in the mouth of the press in any required position. Dial plates are removable, sizes from 10 to 20 in. may be accommodated. It is controlled sep-

(Turn to page 120, please)

Circle 178 on Inquiry Card for more data

**DoALL tells how
Lindberg equipment helps
produce stainless steel
gage blocks**



For the DoALL Company, Des Plaines, Illinois, heat treatment of their Stainless Steel Gage Blocks was a most formidable problem. For lasting accuracy these blocks require extremely hard, wear-resistant surfaces, free from growth or shrinkage, as provided by nitrided stainless steel. Case depth must be controlled accurately and the core maintained at full toughness free of stresses. DoALL found the answer to this problem with a Lindberg Gas Fired Vertical Cyclone Tempering Furnace with a Nitriding Retort.

DoALL

NORMAN SILVER, Chief Metallurgist says, "Our Lindberg equipment supplies the uniformity of heat distribution and the fast accurate control that is needed for the exacting requirements of our product. The furnace responds to control almost instantaneously and maintains the temperature within plus or minus 5°. Its 38" diameter by 36" depth handles 200 to 300 pound loads for the desired production. Results obtained have satisfied us completely with this, the latest of our Lindberg furnaces".

Lindberg provides the most complete line of heat treating furnaces, fuel fired or electric, large or small, for every heat treating requirement. Your Lindberg Field Representative (see your local classified directory) will be glad to consult with you on your heat treating requirements or write us direct. Heat Treating Furnace Division, Lindberg Engineering Company, 2491 West Hubbard Street, Chicago 12, Illinois.

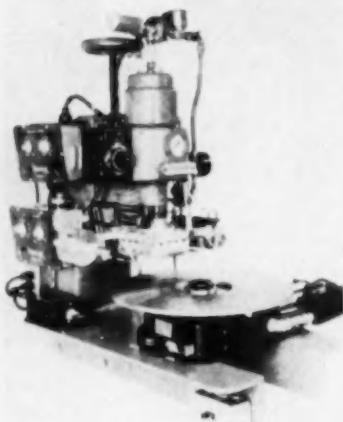
*Los Angeles plant: 11937 S. Regentview Avenue, Downey, California.
In Canada: Birefco-Lindberg Ltd., 15 Pelham Ave., Toronto 9, Ont.
Also, Lindberg plants in Argentina, Australia, England, France, Italy, Japan, South Africa, Spain, Switzerland and West Germany.*



LINDBERG —
heat for industry

(Continued from page 118)
arately by a compact electric-air solenoid valve, with low voltage triggering and independent speed controls.

The machine illustrated has a loading timer for pre-setting loading speed and a separate timer to control



the marking dwell. Operating speeds up to approximately 50 parts per minute can be attained. Automatic ejection can be provided for most work pieces. The combination machine is complete with all controls, starting

switch, pressure, speed, dwell, tape feed cycle control, Acroleaf temperature control and adjustable cycle control. It operates from an air line 60 psi or more with 115 v A for the control circuit.

The dial feed unit may be removed from the number 212 Acroleaf press for hot stamping individual products or items up to 5½ in. high and will reach to the center of the parts up to 14 in. deep. Available from stock requiring only the adding of desired holding fixtures, delivery can usually be made within the time required to engrave the necessary dies. *The Acromark Co.*

Circle 51 on postcard for more data

Automatic Equipment

NEW, automatic equipment which sorts, meters, and installs all types of screws, pins, bolts, rivets, and studs, from $\frac{1}{8}$ to $2\frac{1}{4}$ in. long number 14 screws, at rates as high as 7000 per hour, has been developed.

The standard unit consists of a compact, specially designed hopper unit with positive electrical switch-controlled feed and a standard power screwdriver, pneumatically fed, at 40

lb pressure, through plastic supply hoses and equipped with a self-centering bit and clamping tip of patented design. In operation, the screw itself acts as a pilot to center the screwdriver on the hole.

Each fastener is automatically driven to a uniform, predetermined torque, and the driving cadence is adjustable. A safety check prevents feed of screw to driver unless previous



screw is completely seated, thus eliminating waste and the need for inspection.

Up to 12 screwdrivers may be efficiently operated from one hopper, and operators may work on a radius up to 50 ft from the hopper with normal shop air pressure. Hopper may be monorail-mounted to follow the workers, or the system may be set for fully automatic production line service. *Clyde Engineering and Manufacturing Corp.*

Circle 52 on postcard for more data

HOME OF MIDFOAM®



Here are the advantages you can expect when you specify MIDWEST FOAM—

- ALL TYPES OF Polyester or Polyester FOAMS
- Quality with economy
- Customized service
- Controlled cellular structure
- Uniform porosity and compression
- COMPLETE DESIGN SERVICE AVAILABLE

Midwest Foam is custom engineered to the specifications you must have. No individual requirement is too tough for Midwest to handle whatever your special need—in density, resiliency, molecular structure, shape or size, you can be sure Midwest will fill the order promptly with prime quality polyurethane foam. We invite you to challenge our research chemists.

NO ORDER TOO SMALL OR TOO LARGE

Representatives—we still have some choice territories available. If you would like to represent the finest plastic foam producer in the United States, contact us immediately.

MIDWEST FOAM PRODUCTS COMPANY

1632 Chicago Avenue, Evanston, Illinois, Phone DAVIS 8-6905. Factory: North Chicago, Illinois

Ball Screws

STANDARD ball screw and ball spline assemblies are now being offered in a range of sizes.

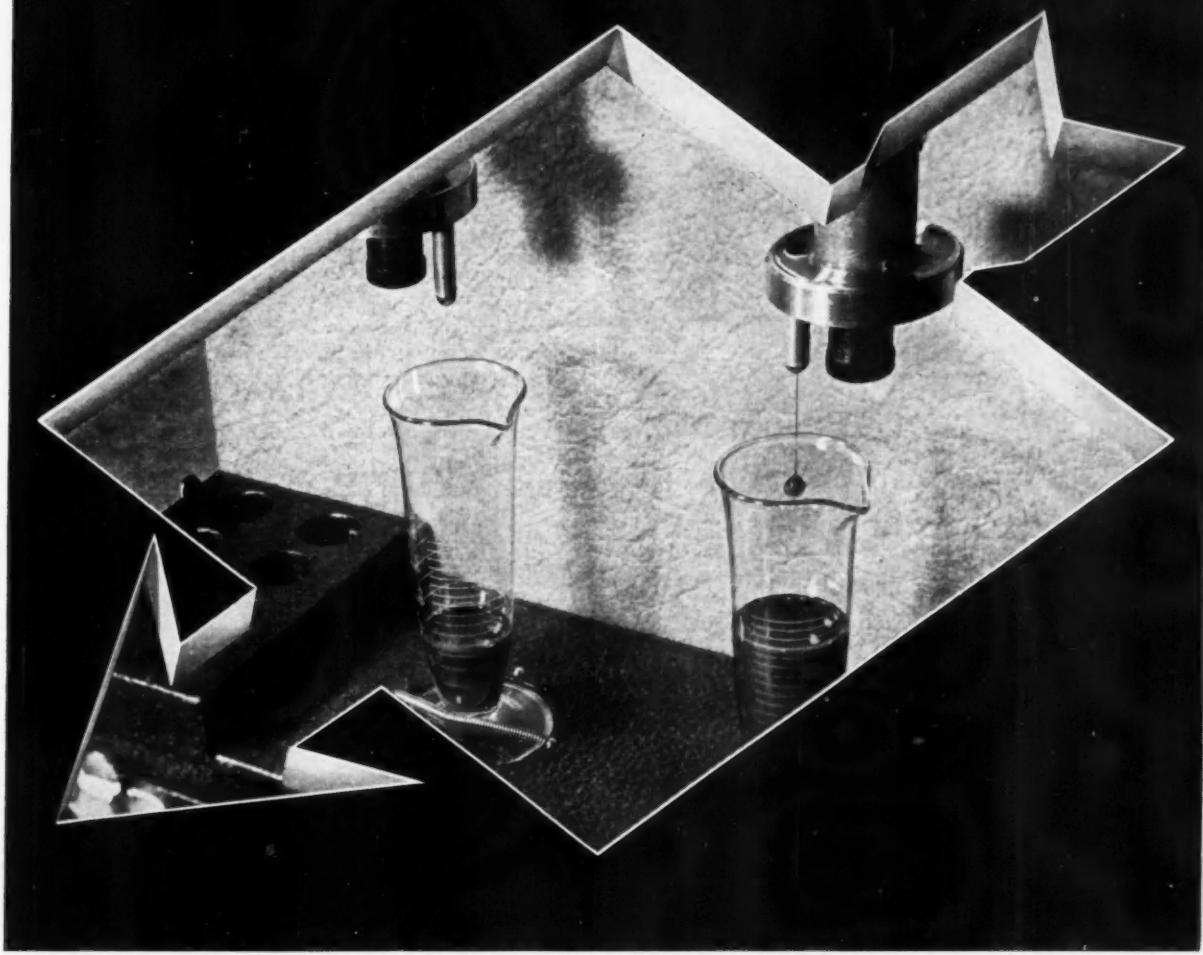
The manufacturer reports this device will give 90 pct accuracy and that the main applications lie prin-



cipally in the moving of loads with low break-away friction, minimum space requirements and low service requirements resulting from minimized friction and wear. *Beaver Precision Products, Inc.*

Circle 53 on postcard for more data

Quality . . . the best economy of all



Under 100-psi pressure in desk-top Suntac demonstration, a straight mineral oil leaks out four times faster than Suntac of the same viscosity.

You can cut oil leakage as much as 75% simply by switching to a Suntac oil

Don't cuss your "problem" leaker, don't look for a bigger drip pan—try a Suntac oil.

Suntac oils, besides their exceptional lubricating qualities, have the remarkable capacity to *stay put* instead of dripping out and making floors unsafe.

Match Suntac against the oil you're now using. Notice how its non-gummy antileak characteristic

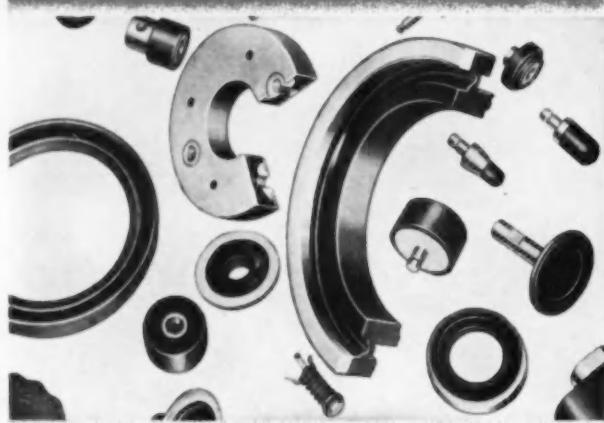
can reduce your oil losses as much as three-fourths. In fact, *many users report oil savings up to 90%!*

Have your Sun representative arrange for the five-minute demonstration shown above—right on your desk top. Or write for Suntac information to SUN OIL COMPANY, Phila. 3, Pa., Industrial Products Dept. AI-10. In Canada: Sun Oil Company Limited, Toronto & Montreal.

MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES



have a **BONDED** to **METAL** problem?



FOR
CUSTOM
COMPOUNDED
PRECISION
FABRICATED
RUBBER
BONDED
TO
METAL
PRODUCTS

Go Goshen

The unique GORBOND process developed by Goshen Rubber permits parts fabricated from natural, synthetic and silicone rubbers, to be bonded to metal, plastics and most anything . . . to meet customer satisfaction. Facilities are complete and modern, for efficiently handling large and small quantities.



On your very next bonding problem, call in the specialist from Goshen.

Goshen Rubber Co., Inc.

2710-O S. TENTH ST.

GOSHEN, INDIANA

Manufacturers' News

(Continued from page 114)

Eaton Acquires Dearborn Marine

Eaton Mfg. Co. has announced an agreement to acquire Dearborn Marine Engines, Inc., of Madison Heights, Mich. John C. Virden, Eaton's chairman and president, said Dearborn will be operated as a division of Eaton under its present personnel headed by Bruce R. Dodds, president. Dearborn produces inboard engines for pleasure boats. The acquisition is a part of Eaton's expansion in the boating field and follows a recent announcement that Eaton plans to produce a new marine drive for use in conjunction with inboard engines.

Fairchild Plans Aluminum Boats

Fairchild Engine & Airplane Corp. plans to build aluminum outboard boats 15 to 19 ft long as part of its marine products line. Three models are planned, a fishing boat, an economy runabout, and a de luxe runabout. Pilot models have been displayed at the Chicago Boat Show. Fairchild also is planning to make aluminum hulls for independent fabricators.

North American Research Center

Autonetics Div. of North American Aviation, Inc., has announced plans for a \$1.2 million electronics research center in Anaheim, Calif. The 60,000 sq ft building will house 46 laboratories. Dr. Robert M. Ashby, Autonetics director of research and engineering, said the center would help cut the time span during which technological developments proceed from basic scientific investigation to final production.

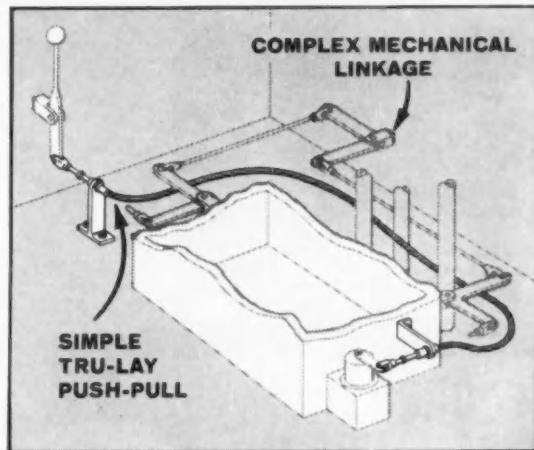


J. R. Bartizal, president of Clearing Div., U. S. Industries, Inc., congratulates Peter Kaufmann on scholarship awarded by firm. The youth's father, Gustav, is at right. U. S. Industries gives scholarships to employees' sons for scholastic standing and school leadership.

ACCURATE REMOTE CONTROL FOR HUNDREDS OF PRODUCTS

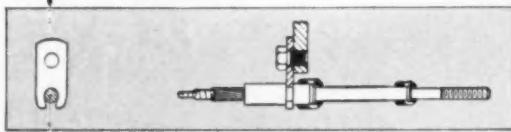
-- with Tru-Lay PUSH-PULL Controls

If your products involve remote control—electrical, hydraulic, pneumatic or direct—TRU-LAY PUSH-PULL FLEXIBLE CONTROLS can help solve your design problems. They provide positive remote control over short or long distances—up to 150 feet from the control point. Because they operate while flexing, they can snake around obstructions. They will not buckle. They are ruggedly constructed, easily installed and operated, sealed against dirt and moisture, and will handle jobs with as much as 1,000 lbs. input. PUSH-PULL CONTROLS are simple, have but one moving part, are noiseless and give a lifetime of accuracy. Mechanical linkages, on the other hand, are complex. Unlike PUSH-PULL CONTROLS, they are made of many parts, wear at many points, and produce increased backlash, vibration rattles and lost accuracy.

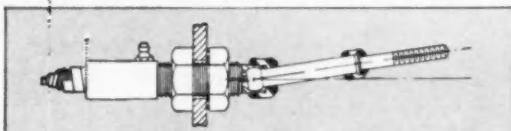


THESE FEATURES HELP SOLVE DESIGN PROBLEMS

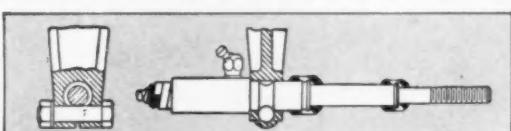
Anchorage



Clip anchorage • a simple clip for light loads

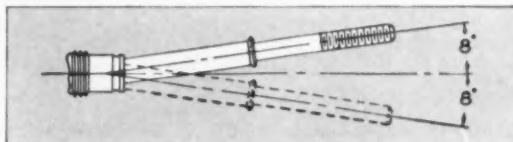


Bulkhead anchorage • for heavy-duty installations



Machined bracket anchorage • can be furnished for mounting any PUSH-PULL cable at the swivel terminal

Swivel Action



Standard assemblies have end fittings with a swivel movement of $\pm 8^\circ$ to compensate for misalignment and rise or fall of lever arms. Swivel joints, and the sliding ends, are sealed against dirt and moisture.

PUSH-PULL DATA FILE SHOWS HOW TO SIMPLIFY, IMPROVE DESIGN



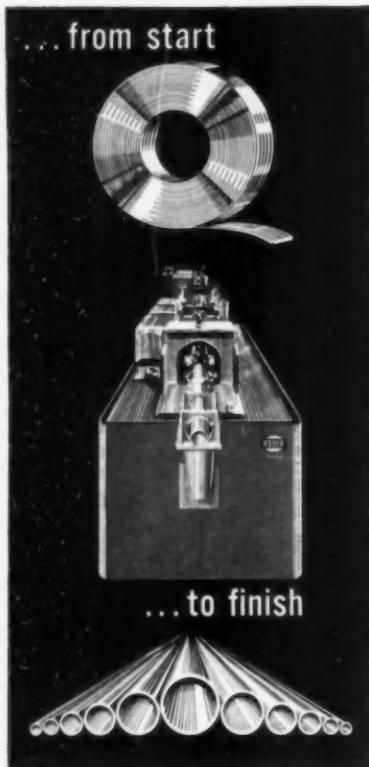
- Write for your PUSH-PULL Data File. It contains a complete set of engineering bulletins which describe in detail the operation of PUSH-PULL CONTROLS, their applications, features and advantages.



PUSH-PULL CONTROLS

Automotive and Aircraft Division • American Chain & Cable Company, Inc.

601-H Stephenson Bldg., Detroit 2
6800-H East Acco Street, Los Angeles 22 • 929-H Connecticut Ave., Bridgeport 2, Conn.



YODER PIPE & TUBE MILLS

A Yoder engineer can help you realize remarkable savings in the manufacture of ferrous or non-ferrous pipe or tube. He can show you how present Yoder Pipe or Tube Mill owners are increasing production, lowering over-all manufacturing costs and reducing downtime through use of Yoder Mills.

If your products require pipe or tubing from $\frac{1}{8}$ " to 26" diameters, Yoder Pipe or Tube Mills and accessory equipment can help you produce your product more efficiently to meet today's competitive markets.

In addition to Pipe or Tube Mills, Yoder engineers and builds a complete line of Slitting equipment and Cold Roll-Forming Machinery.

For complete information on Yoder Tube Mills...send for the fully illustrated, 64 page Yoder Tube Mill book...it is yours for the asking.



THE YODER COMPANY
5553 Walworth Avenue • Cleveland 2, Ohio



Circle 169 on Inquiry Card for more data

What's NEW at the

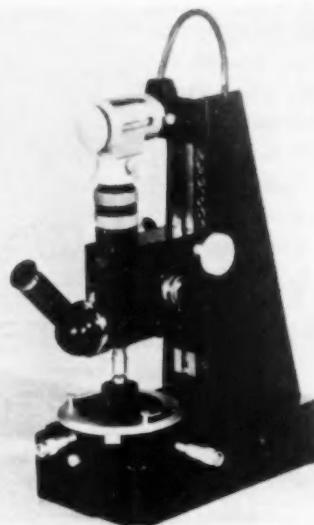
NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 106)

Measuring Equipment

A complete line of precision hand tools and optical industrial measuring equipment will be on exhibit at the show. Scherr-Tumico plans to have on exhibit a representative display of their entire line of precision measuring tools, gages, and inspection equip-



ment, as well as gear hobbing and gear testing equipment, and many new items will be shown.

All machine tools and instruments are operated under actual working conditions and demonstrators will be in attendance. *George Scherr Co., Inc.* *Tubular Micrometer Co.* Booth 1240

Circle 38 on postcard for more data



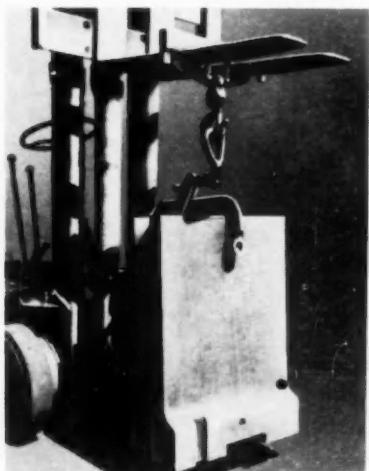
placed and designed for ease of operating, houses a low voltage microswitch which initiates the welding sequence through a pilot valve incorporated into the timer. *Aro Spot Welder Div., Guthery Machine Tool Corp.* Booth 1368

Circle 39 on postcard for more data

Fork Lift Attachment

An all new materials handling device known as the Automatic Safety Lock Fork Lift Attachment, is now available to simplify transporting heavy loads, such as dies or motors.

It is made entirely of forgings, including a safety swivel hook. When



Spot-Welding Gun

The air operated model 407 spot-welding gun is a fully automatic unit with variable squeeze weld and forge time for signal or repeat action.

Tip pressure is rated at 660 lb.

This gun, designed with large, single acting tandem cylinders ensures high pressure. While the spring-return arrangement acts as cushion thus avoiding tip-hammering, it also reduces air-consumption.

The trigger handle, especially

slipped onto the forks, two knife edged levers grip the forks tightly as the load is applied, but can be easily slipped off when the load is released. Especially designed to transform any fork lift truck into a mobile overhead lifting unit. *Merrill Brothers.* Booth 1372

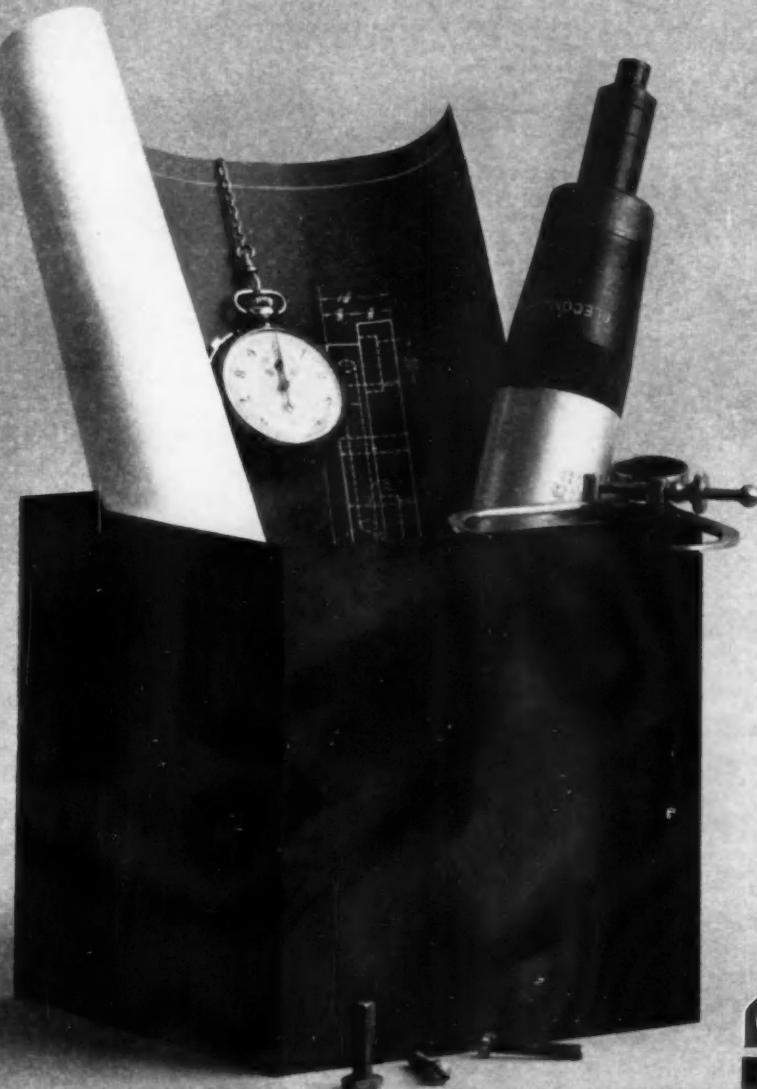
Circle 40 on postcard for more data

(Turn to page 126, please)

we admit it!

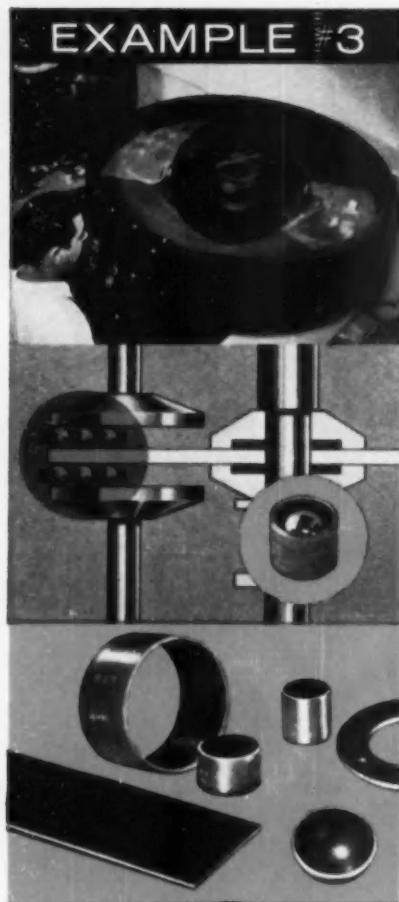
Cleco design engineers do stick their noses in your business!

Our design staff **does** know a lot about your operation. They have to. Their job is to design the air tools you need **almost before you need them**. They must design top performing tools that are simple to operate. Economical to maintain. Tools to stay on the job shift after shift. Tools that fit into the production plans of automated factories . . . specialized, custom-production operations as well. What's more, Cleco tool designers must think quality all the way, because every Cleco air tool has built-in quality. It's part of the Cleco® "Quality Control Package."



"quality tools engineered for industrial progress"

A Division of REED ROLLER BIT COMPANY • P. O. BOX 2119 • HOUSTON 1, TEXAS, U.S.A.
IN CANADA: Cleco Pneumatic Tool Company of Canada, Ltd., 927 Millwood Road, Leaside (Toronto), Ontario



DU bushings (bottom) partially surround each steel ball in the new "Rouveral" ball-galaxy principle variable speed drive (center), capable of operating up to 8000 rpm. This permits dramatic advance in centrifuge equipment (top) for more accurate missile and aircraft component operational G-force testing. Design illustrates use of DU bushings in lubricated ball bearing where dry operational capability pays off in hard-to-lubricate areas.

DU* DRY BEARINGS Solve Another Problem

"Our 909 Variable-Speed Transmission is a high-torque, ball-disc friction drive† which utilizes two clusters of steel balls for the transfer elements instead of the more conventional single-ball configuration. Many bearing materials were tested before a satisfactory cluster cage assembly was evolved. The successful design incorporated DU bushings which are partially swaged around each ball for increased bearing area. In addition to an extremely low coefficient of friction, the bushings transfer heat away from critical areas much more efficiently than other materials tested. Problems concerning wear, and tolerance of foreign particles have virtually disappeared."

R. E. Brown
Vice President—Engineering
GENISCO, INC.

DU metal is an ideal bearing material for many applications. It withstands much higher velocities, runs much cooler at lower speeds than other unlubricated bearings . . . has a compressive strength of 51,000 p.s.i. DU metal is applied without the need for temperature-limiting adhesives . . . will withstand from -328°F to $+536^{\circ}\text{F}$.

GARLOCK

Apply DU dry bearings to appliances, automobiles, aircraft, farm and industrial machinery, office equipment. Standard bushings and thrust washers available for $\frac{1}{4}$ " to 2" shafts; strip available for special fabrication. Write for engineering catalog DU-458. Special Products Dept., Garlock Inc., P.O. Box 612, Camden 1, New Jersey.

*Trademark, Glacier Metal Company Ltd.

†Manufactured under license agreement from W.S. Rouveral, University of California at Berkeley



What's NEW at the

NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 124)

Roll-Around Unit

A roll-around ultrasonic cleaner will be displayed at the 42nd National Metal Congress. The self contained unit, mounted on large casters for ease of movement and quiet operation consists of an ultrasonic generator, transducer and counter top. Optional accessories include a 2-5 micron filter and heating elements to maintain liquid temperature from ambient to 160°F .

No connection to drain or plumbing is required since the cleaner is drained



by means of a flexible hose connected to the unit. Tanks are positioned off-center to provide a work area on which the baskets can be placed.

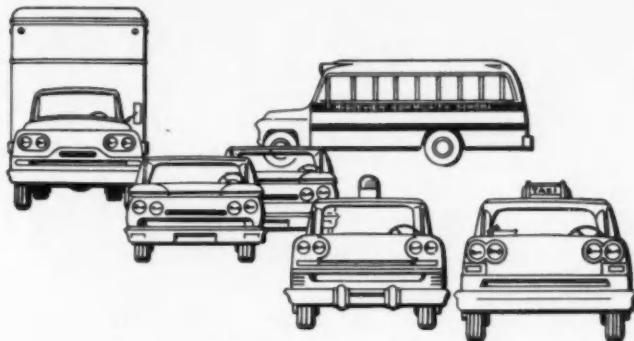
The roll-around cleaner, which is plugged into a 115 volt line to operate, can be used with solvents, detergents, mild acids and alkaline cleaners. The tank and counter tops are stainless steel and the cabinet heavy gauge steel. *National Ultrasonic Corp. Booth 1969*

Circle 41 on postcard for more data

Console Vacuum Furnace

A console cold wall vacuum furnace which consolidates the multiple components of the unit into a compact, attractive case of modern design will be introduced at the ASM show.

Designed as a complete package, (Turn to page 130, please)



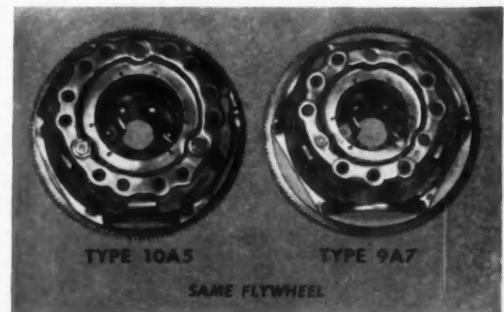
New Interchangeable **BORG & BECK** Clutches for Fleets, Police Cars, Taxis

More Capacity—no increase in
bolt circle or flywheel size

Now there's no need to change the bell housing, flywheel, motor mounts or pedal linkage when converting cars for fleet, police, taxicab or other heavy duty service. Borg & Beck's new A5 clutches are designed specifically for these installations, as well as for trucks and school buses—provide the additional capacity required, yet are interchangeable with the next smaller size of Borg & Beck Types A7, A8 or A9 clutches.

Type 10A5, for example, mounts on the same flywheel bolt circle as Type 9A7—yet is rated at 265 ft.-lbs. torque capacity compared with 210 ft.-lbs. for the 9A7.

Like all Borg & Beck clutches, the new Type A5 clutches are designed, engineered and built to Borg & Beck's leadership standards for quality, performance and value. That's your assurance of complete satisfaction. Consult our engineers for full details.



Reg. U.S. Pat. Off.



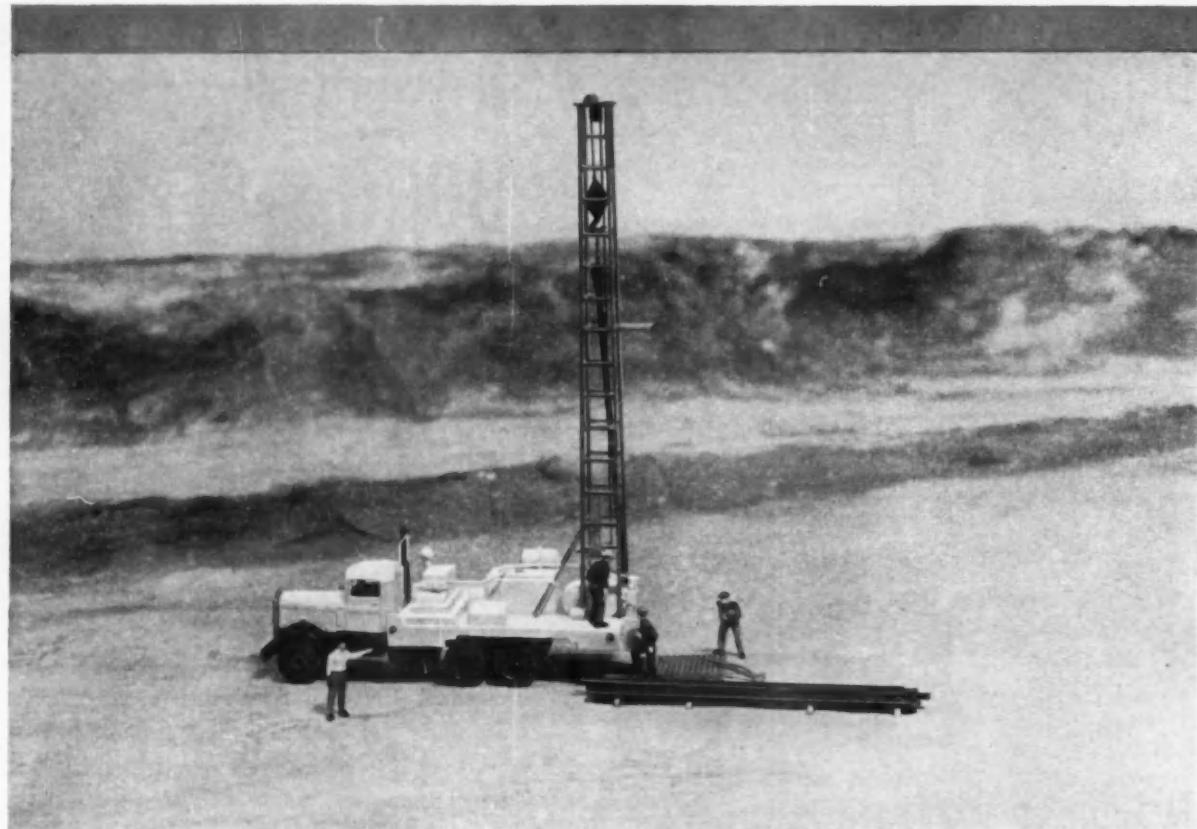
BORG-WARNER.

BORG & BECK

THE AUTOMOTIVE STANDARD FOR MORE THAN 40 YEARS
BORG & BECK DIVISION, BORG-WARNER CORPORATION, CHICAGO 38, ILLINOIS

Export Sales: Borg-Warner International, 36 S. Wabash, Chicago 3

Circle 172 on Inquiry Card for more data.



Down-to-earth reasons for using Custom Quality OHIO Tubing

As in rotary drilling, which uses steel tubing internally upset by Ohio Seamless, greater strength and lighter weight may be important in your product.

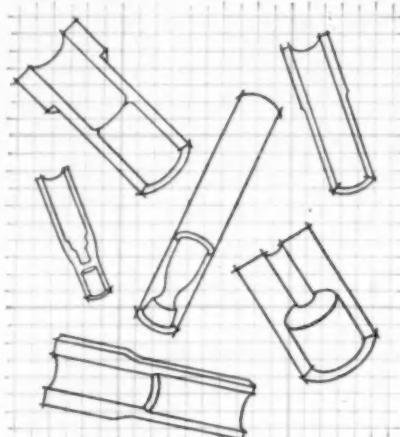
So before selecting a tubing source consider these important facts. OHIO Tubing is always the exact tubing you need for your product because OHIO Tubing is CUSTOM MADE for your product. Your order is manufactured to your own specifications to produce steel tubing especially for your application — the precise grade, analysis, size, shape, special anneal and tolerances best suited to your needs.

Ohio Seamless Tube produces both seamless and electric welded steel tubing — is prepared to form many finished or semi-finished tubular parts to your designs.

To get the most from your next steel tubing order, use Custom Made OHIO Tubing. Contact your nearest Ohio Seamless representative, or send part drawings to the plant at Shelby, Ohio — Birthplace of the Seamless Steel Tube Industry in America.

A-3061A

Model illustrated built to 3.5 mm scale.



Typical Ohio Seamless
tubular upset forgings



OHIO SEAMLESS TUBE

Division of Copperweld Steel Company • SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Kansas City, Los Angeles (Lynwood), Miami, Moline, New York, New Orleans (Chalmette), Philadelphia (Wynnewood), Pittsburgh, Richmond, Rochester, St. Louis, St. Paul, Salt Lake City, Seattle, Tulsa, Wichita

CANADA: Railway & Power Engr. Corp., Ltd. • **EXPORT:** Copperweld Steel International Company, 225 Broadway, New York 7, New York



Timing gears made of CDF Celoron will not pick up and amplify sound due to Celoron's naturally low tone frequency. Tests show that Celoron gears reduce noise by up to 50% compared to all-metal gear sets!

Made of quality controlled, fabric reinforced phenolic resin, Celoron® high-impact gears are constantly replacing metal in critical areas ranging from earth-moving machinery to compact cars to movie projectors.

Celoron molded materials are only one family of products from industry's largest selection of

non-metallic structural and electrical materials . . . including thermosetting laminates, vulcanized fibre, silicone rubber, and mica.

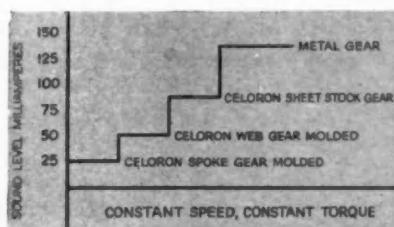
This wide choice gives you every assurance of meeting your exact quality and cost needs in plastic material. Refer to Sweets PD file or write to us for the latest Celoron catalog.



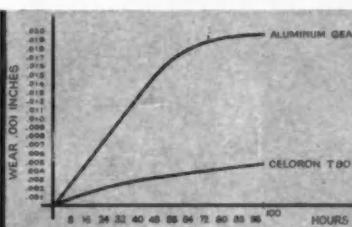
CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE COMPANY • NEWARK 2, DEL.

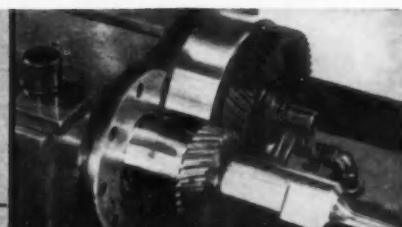
In Canada, 46 Hollinger Road, Toronto 16, Ont.



Low sound level of Celoron is shown by this graph which compares metal to the different types of Celoron gears.



Long wearing characteristics of Celoron gears are here contrasted to the shorter life spans of metal-made gears.



Quality control of Celoron gears is assured by special testing machines such as this in CDF laboratories.

What's NEW at the

NATIONAL METAL SHOW

PHILADELPHIA
OCTOBER 17-21

(Continued from page 126)

installation consists of connections to water and power. It is so designed that it is virtually portable. Maximum operating furnace temperature of the standard unit is 2200 deg F.

with vacuums in the 10⁻⁴ mm. Hg. range. Maximum temperature of the furnace can be developed in a matter of a few minutes and cooling can be effected almost as rapidly. The 10 in. diam by 20 in. deep stainless steel vacuum chamber offers a useful work area of eight in. diam by 14 in. deep.

The access door and all control equipment are located on the front panel with access panels on the sides and back to facilitate servicing. A crank-operated work pedestal transfers work from lower section (vacuum cooling chamber) to heating chamber

which contains 30kva heating elements with sufficient power to heat a chamber to 3000 deg F when special element and baffling materials are used. Interchangeable heating elements and radiation shields increase operating flexibility of unit in vacuum brazing and heat treating production work. The use of potassium titanate insulation reduces heat losses and the number of radiation shields required. The "cold wall" design contributes to the compactness of the overall unit and prevents objectionable heating of the auxiliary equipment, instrumentation, and surrounding work area. Circuit is protected by automatic current limiting. Power, vacuum, and furnace temperature control equipment is all of latest design. C. I. Hayes, Inc. Booth 1454

Circle 42 on postcard for more data

SIMPLICITY in the Heart of the Modern Diesel Engine

Simple—Only 8" long, 3 1/4" wide, 5 1/2" high... weighs less than 10 pounds... fewer parts to service, fewer adjustments to make.

Versatile—Because of accessories that can be built in or added at low cost taking up no, or very little, valuable engine block space.

Economical—Initial cost is less, costs less to service, saves money because of its dependable service.

Write for guides to better fuel injection. One features the pump, the other an efficient, economical filter.



Circle 175 on Inquiry Card for more data

HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
Division of Standard Screw Company

Temperature Indicators

Aerosol packaging of Tempilaq[®] temperature indicating coatings will be presented for the first time, at the A.S.M. Show.

The spray-can package provides a convenient method of coating large surfaces with Tempilaq[®]. Such applications are encountered in freeing plugged liquid-metal lines in nuclear reactors, non-destructive testing of honeycomb panels, monitoring the operating temperatures of reaction vessels, fabrication of massive structures, etc.

Some 40 systematically spaced temperature ratings, covering the range from 100 deg F to 650 deg F inclusive, are now available in a choice of spray-type containers or standard glass bottles. Development is under way to perfect aerosol packaging of the other 40 temperature ratings of Tempilaq[®] spanning the range from 700 deg F to 2500 deg F. Tempil[®] Corp. Booth 1327

Circle 43 on postcard for more data

"Model" Exhibit

A 10 ft. scaled model of a Surface single pass strip processing line for ferrous and non-ferrous metals will be on display at the show.

Also featured will be the latest standard and special industrial furnace developments for the heat treatment of metal products. Surface Combustion Div. of Midland-Ross Corp. Booth 1540

Circle 44 on postcard for more data

Take SUSPENSE out of SUSPENSION with LEAF SPRINGS



You can depend on leaf springs!

In addition to prime function, their design characteristics—

-  Cushion thrusts of "starts" and "stops"
-  Maintain alignment of springs, frame, and axles
-  Control load balance
-  Minimize sidesway
-  Absorb shocks

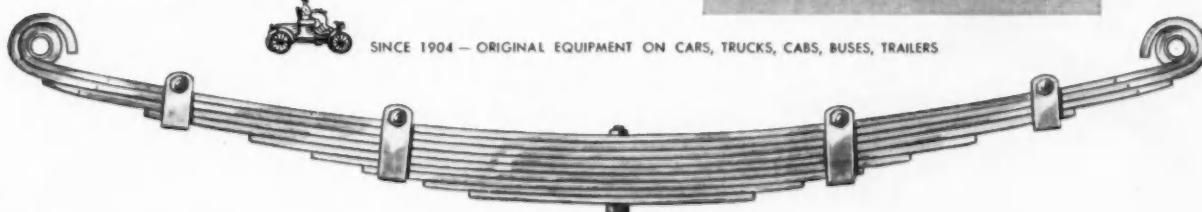
Simplicity, strength, dependability, and long wear
are inherent in correctly engineered leaf springs.



DETROIT STEEL PRODUCTS DIVISION

of *Tenestra* INCORPORATED

6000 Coniff Avenue, Detroit 12, Michigan

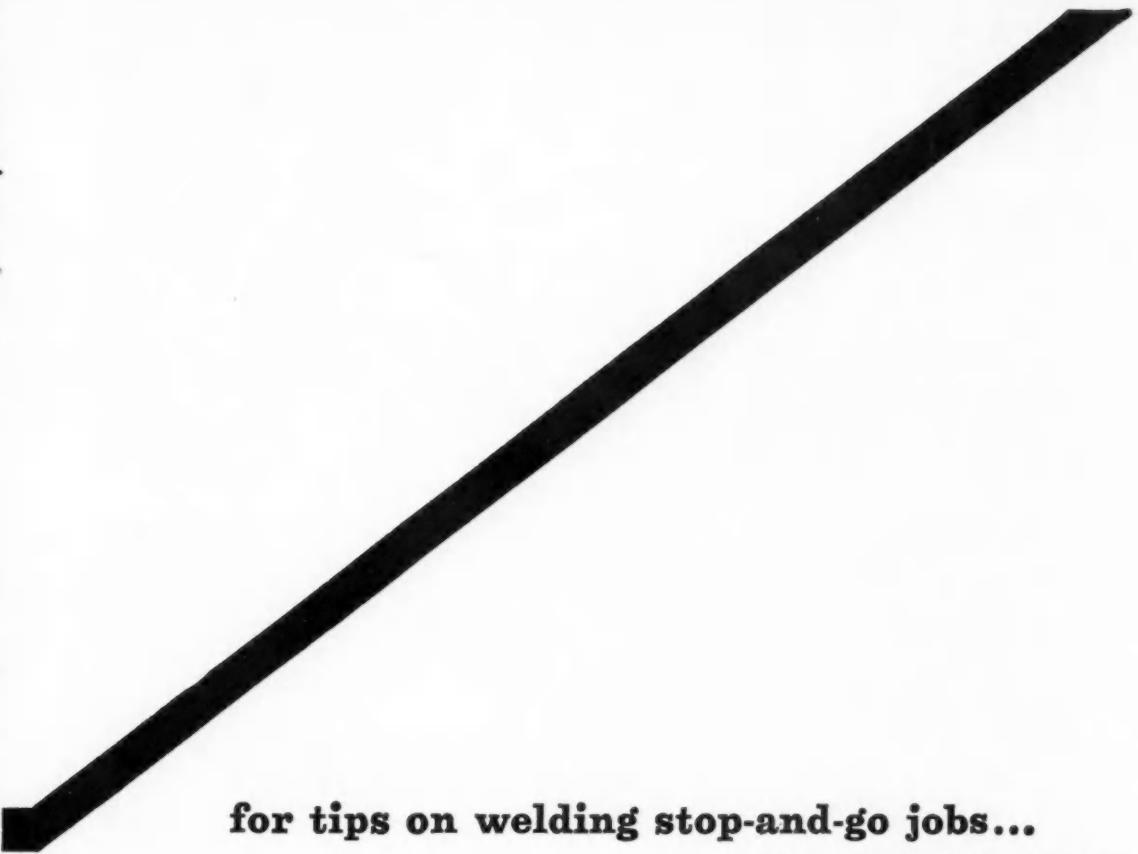


SINCE 1904 — ORIGINAL EQUIPMENT ON CARS, TRUCKS, CABS, BUSES, TRAILERS

For tips on finding the Great Horned Owl...
call an *ORNITHOLOGIST*

(specialist on birds)





for tips on welding stop-and-go jobs...
call in LINCOLN

(specialists in arc welding)

AKANSAS MANUFACTURER OF MOBILE HOMES doubled the welding speed on his undercarriages by simply changing electrodes—and in addition, saved over \$8000 in the first year.

Manufacturing cost on undercarriage fabrication was prohibitive. Thirteen gauge cross members were welded to twelve gauge channels by welds made in both vertical and flat positions. These short welds on steel having some scale and oil slowed down production.

Finally they called in their LINCOLN Field Engineer. Painstaking tests, made by the LINCOLN man with the welding foreman and plant superintendent, proved LINCOLN's Fleetweld 37 electrodes far better for this application.

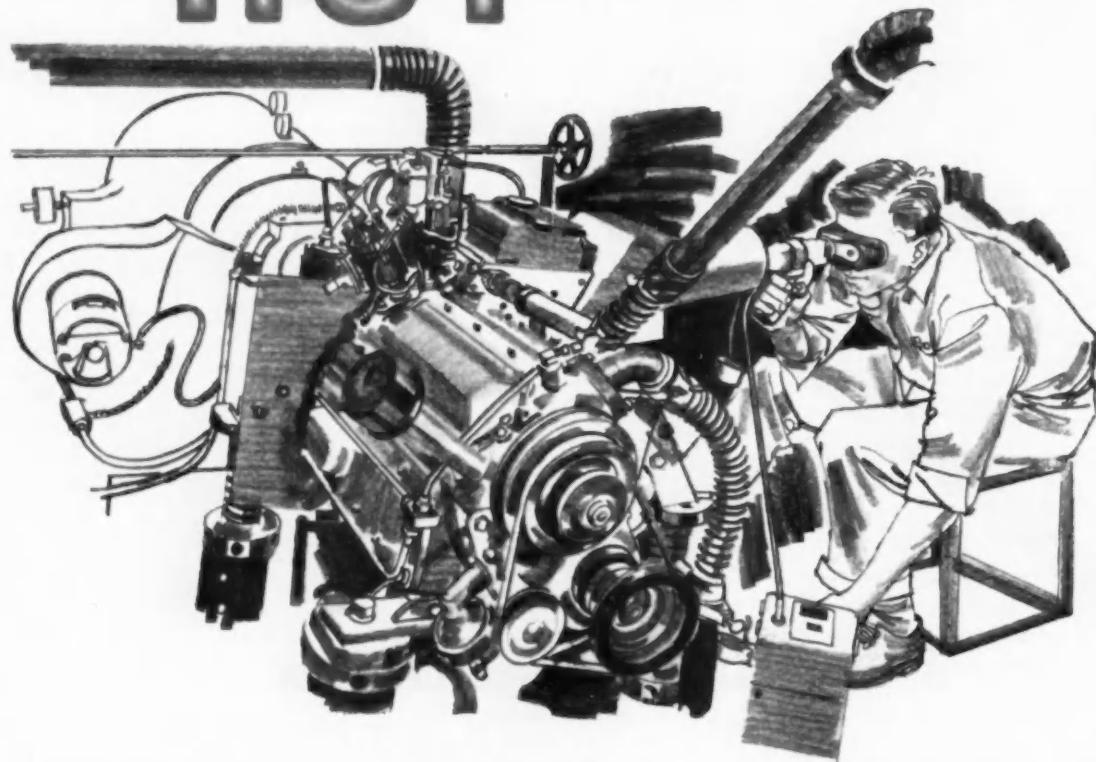
RESULTS: lower costs . . . welding speed doubled . . . cleaning time cut in half.

That's why we say it's a good idea to do business with LINCOLN where arc welding is a specialty and cost reduction comes to you as a "plus" at no charge.

THE LINCOLN ELECTRIC COMPANY
Dept. 1740 • Cleveland 17, Ohio

LINCOLN
WELDERS

How HOT are Your Valves?



Eaton Technique Determines Valve Operating Temperatures—Permits Accurate Selection of Valve Materials

1. The valve to be studied is duplicated in a special steel which has a known temperature response in terms of hardness.
2. The temperature-responsive valve is run for a brief period in a single cylinder test engine, under the operating conditions which are of interest to the engine builder or user.
3. After removal from the engine, the valve is sectioned in the metallurgical laboratory, and checked for hardness at all strategic points. From these hardness indications the corresponding temperatures at which the valve was running can be accurately computed.

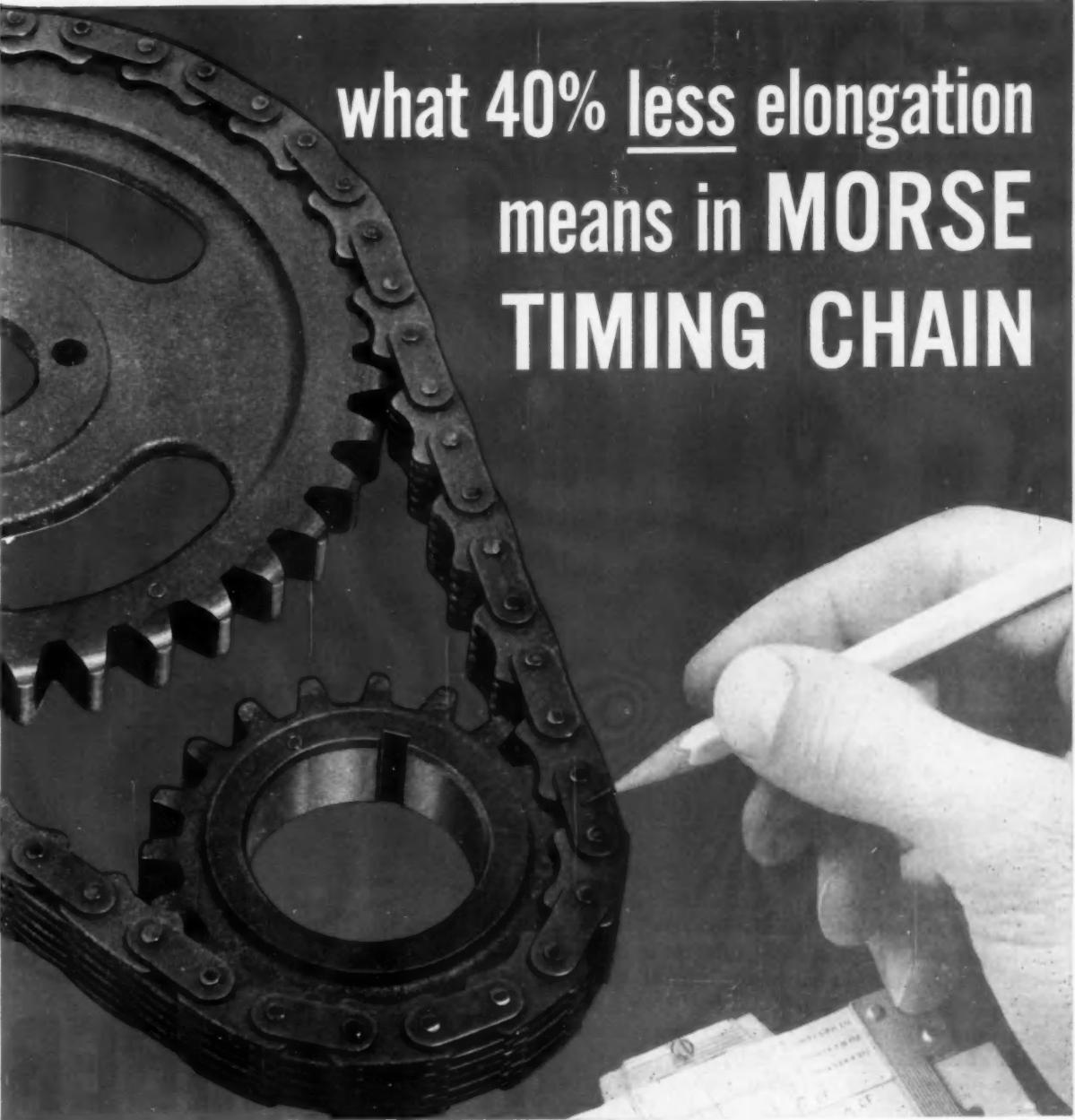
This Eaton technique permits the selection of suitable valve materials and designs to meet the requirements of each specific engine. Eaton Valves—made from materials selected or developed by means of the above technique—are setting outstanding performance records.



The Eaton Valve Division is fully equipped to supply all of the services necessary for valve temperature determination, including the making of the temperature sensing valves. Call on us.

EATON

— VALVE DIVISION —
MANUFACTURING COMPANY
BATTLE CREEK, MICHIGAN



what 40% less elongation means in **MORSE** **TIMING CHAIN**

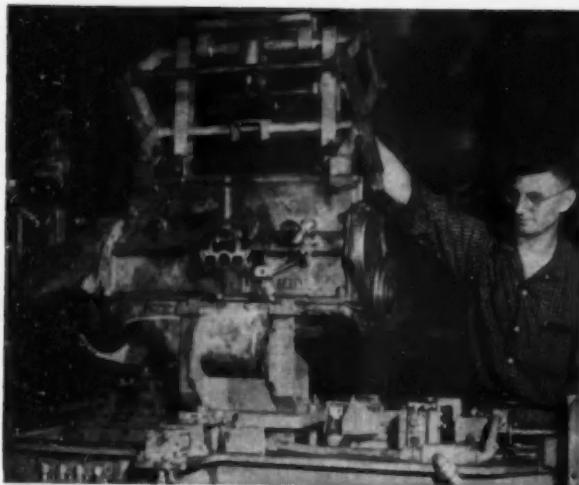
The timing chain in your car is most likely built by Morse. Practically all American and Canadian automotive engineers specify this make. These men know from experience that with Morse precision-built timing chain they get 40% *less elongation* than with any other make. That means more accurate engine timing for thousands of miles beyond normal engine life expectancy.

To accomplish this higher durability, Morse chain design uses bar-link construction on every other pitch. Locked linkage of this type prevents chain from stretching in spite of wear. Improved materials and the latest statistical control of metallurgical processes supplement the bar-link advantages to insure split-second timing for thousands of additional miles.

Reasons like these explain why engine builders cannot buy a quieter, more dependable timing chain anywhere else in the world. For further information on the chain that cuts elongation 40% write: Morse Chain Company, Dept. 36-100, Detroit, Mich.; or Ithaca, N.Y. Export Sales: Borg-Warner International, Chicago 3, Ill. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ont.

MORSE **BW**
TM
A BORG-WARNER INDUSTRY

THIS PRODUCTION LINE IS FASTER, SAFER, WITH HEPPENSTALL TONGS



Being pushed upward into the locked-open Tongs, this engine block will trip a mechanism causing jaws to automatically close.

Air operated lifts are an integral part of the engine block balancers used at Chrysler Corporation's Trenton, Michigan plant. When balancing is completed, the lifts push the blocks upward into Heppenstall Tongs; jaws close automatically, and the block is on its way to the next work station. At the same time, another pair of Heppenstall Tongs is bringing in another block for balancing.

Seventy-five of these 500-lb. capacity Heppenstall Tongs are used to handle 6-cylinder engines of the new Plymouth, Dart and Valiant. Another seventy-five Heppenstall Tongs, slightly different in design, handle V-8 engines on conveyor lines of Dodge, DeSoto, Chrysler and Imperial.

Chances are Heppenstall Tongs can help you more quickly and safely move materials, semi-finished or finished products. For more information, call your Heppenstall Representative. Or, send us your load and operating requirements for a quotation.

HEPPENSTALL COMPANY

Pittsburgh 1, Pennsylvania

PLANTS: Pittsburgh and New Brighton, Pa. • Bridgeport, Conn.

MIDVALE-HEPPENSTALL

COMPANY

Nicetown, Philadelphia 40, Pa.



Die Blocks • Forgings • Back-Up Roll Sleeves • Rings • Industrial Knives • Materials Handling Equipment • Pressure Vessels Hardened and Ground Steel Rolls • Vacuum and Consumable Electrode Melted Steels

IF IT HANGS FROM A CRANE . . .
HEPPENSTALL CAN HANDLE IT



Circle 179 on Inquiry Card for more data

136

LET OUR QUALIFIED SALES
ENGINEERS HELP YOU SOLVE
YOUR FUEL TANK PROBLEMS.



ALWAYS SPECIFY SNYDER

Snyder Tank CORPORATION

P.O. BOX 14, BUFFALO 5, NEW YORK

Circle 180 on Inquiry Card for more data



REMEMBER REEVECOTE

WHEN YOU SPECIFY COATED FABRICS

Most complete line of coated fabrics for the automotive industry. Whatever you need in a coated fabric . . . whether it's resistance to high temperature, oil, abrasion . . . or flexibility at low temperatures . . . you can be sure there's a REEVECOTE designed to do the job best.

Choose from natural or synthetic rubber coatings. Get the protection of Reeves Brothers quality control. For better coated fabrics, specify REEVECOTE

REEVES VULCAN Reeves Brothers, Inc., Vulcan Rubber Products Division

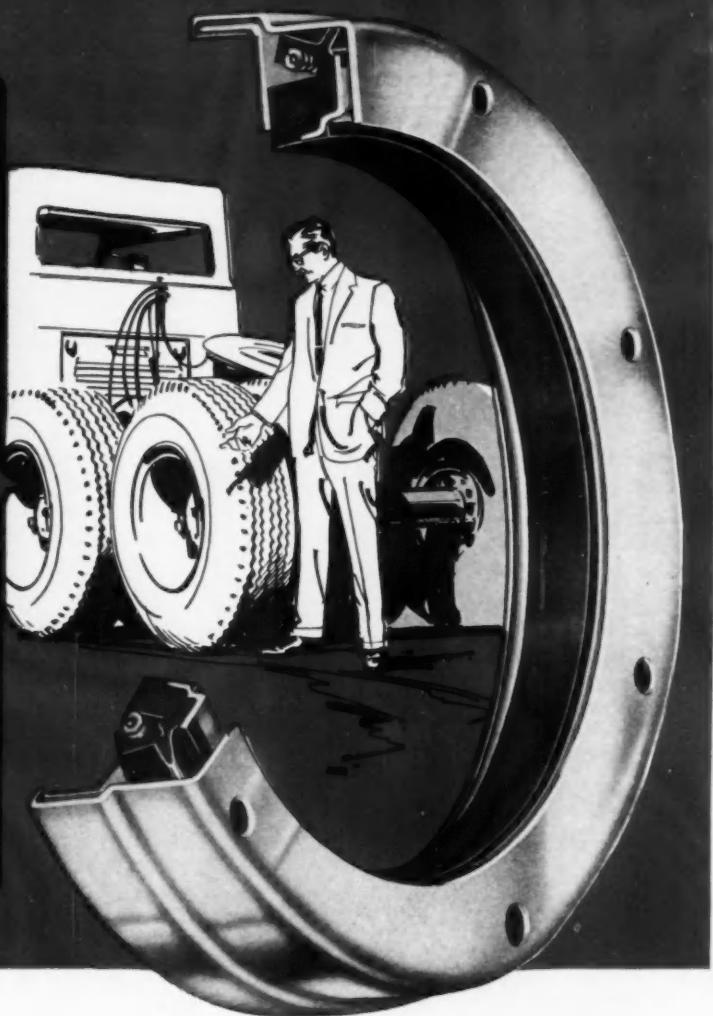
1071 Avenue of the Americas • New York 18, New York

Circle 181 on Inquiry Card for more data

AUTOMOTIVE INDUSTRIES, October 15, 1960

**"I want a
100,000
mile
wheel
seal,"**

said truckmaker



"Here's Scotseal," said C/R

Premature wheel oil seal failure—often within the warranty period—was plaguing a major truck manufacturer. This was costly. One seal replacement took three hours labor and three hours tractor downtime—important money to the maker, dealer and buyer. Then C/R found an answer to the problem. A unique, new design called the C/R Scotseal* was submitted and tested . . . then tested again and again. First result: C/R Scotseals repeatedly ran 100,000 miles and more with no sign of failure. Second result: they're approved now for every truck tractor this manufacturer makes.

Just why does this seal go 100,000 miles? C/R developed

a special, ideal sealing surface and made it integral with the seal. The lip runs on this surface, *not on the shaft or bore*. In operation, centrifugal force creates positive, constant contact for leak-free performance. Also, the seal lip is completely encased and pre-lubricated, protecting it against damage in handling and assembly. This remarkable seal merits your consideration wherever high production runs are involved; where oil retention is difficult; and where equipment downtime and replacement costs are critical. The savings it can afford you and your customers may far outweigh the additional cost of this top-quality seal.

Write for your copy of C/R Scotseal Bulletin SS-100.*

CHICAGO RAWHIDE MANUFACTURING COMPANY

OIL SEAL DIVISION: 1205 ELSTON AVENUE • CHICAGO 22, ILLINOIS

Offices in 55 principal cities. See your telephone book.

In Canada: Chicago Rawhide Mfg. Co. of Canada, Ltd., Brantford, Ontario

Export Sales: Geon International Corp., Great Neck, New York

C/R Products: C/R Shaft & End Face Seals • Sirvene (synthetic rubber) molded pliable parts
Sirvias-Conpor mechanical leather cups, packings, boots • C/R Non-metallic Gears.



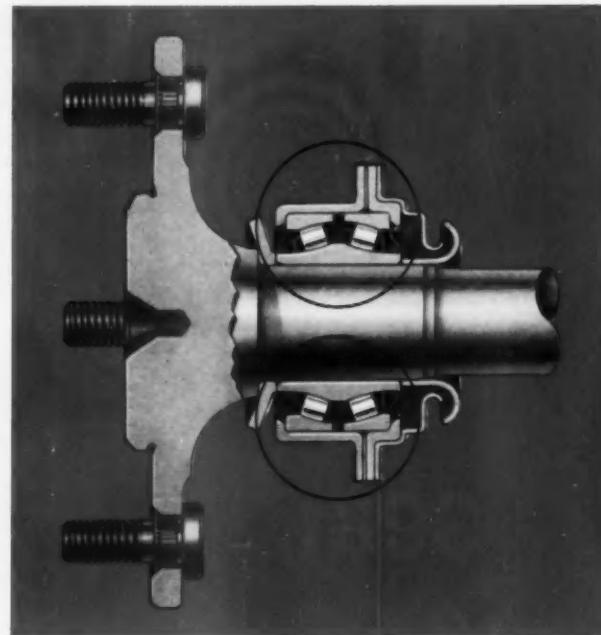
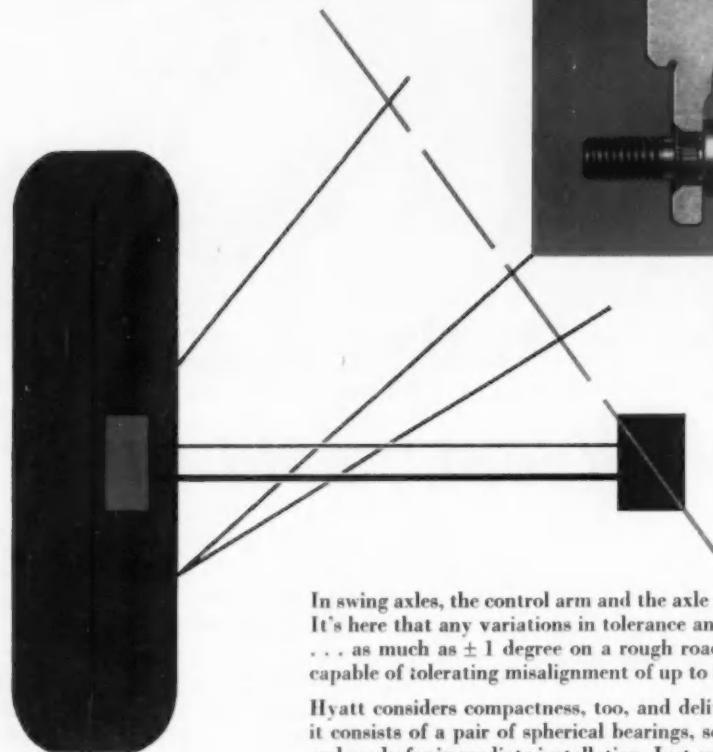
*Reg. U. S. Pat. Off.

COMPACTNESS COMES EASY...

IF YOUR
"SPECS"
READ
HYATT



SELF-ALIGNING HYATT BEARINGS GIVE SWING AXLES MORE ROOM TO FLEX!



Used in the swing axles of both Chevrolet's Corvair and Pontiac's Tempest, this Hyatt spherical bearing accommodates up to ± 3 degrees of misalignment between the axle and the suspension control arm. The complete bearing package is delivered ready for press fitting onto the axle as shown.

In swing axles, the control arm and the axle meet at only one point—the Hyatt bearing. It's here that any variations in tolerance and normal deflection appear as misalignment . . . as much as ± 1 degree on a rough road. Hyatt's answer is a self-aligning bearing capable of tolerating misalignment of up to 3 degrees, for an adequate margin of safety.

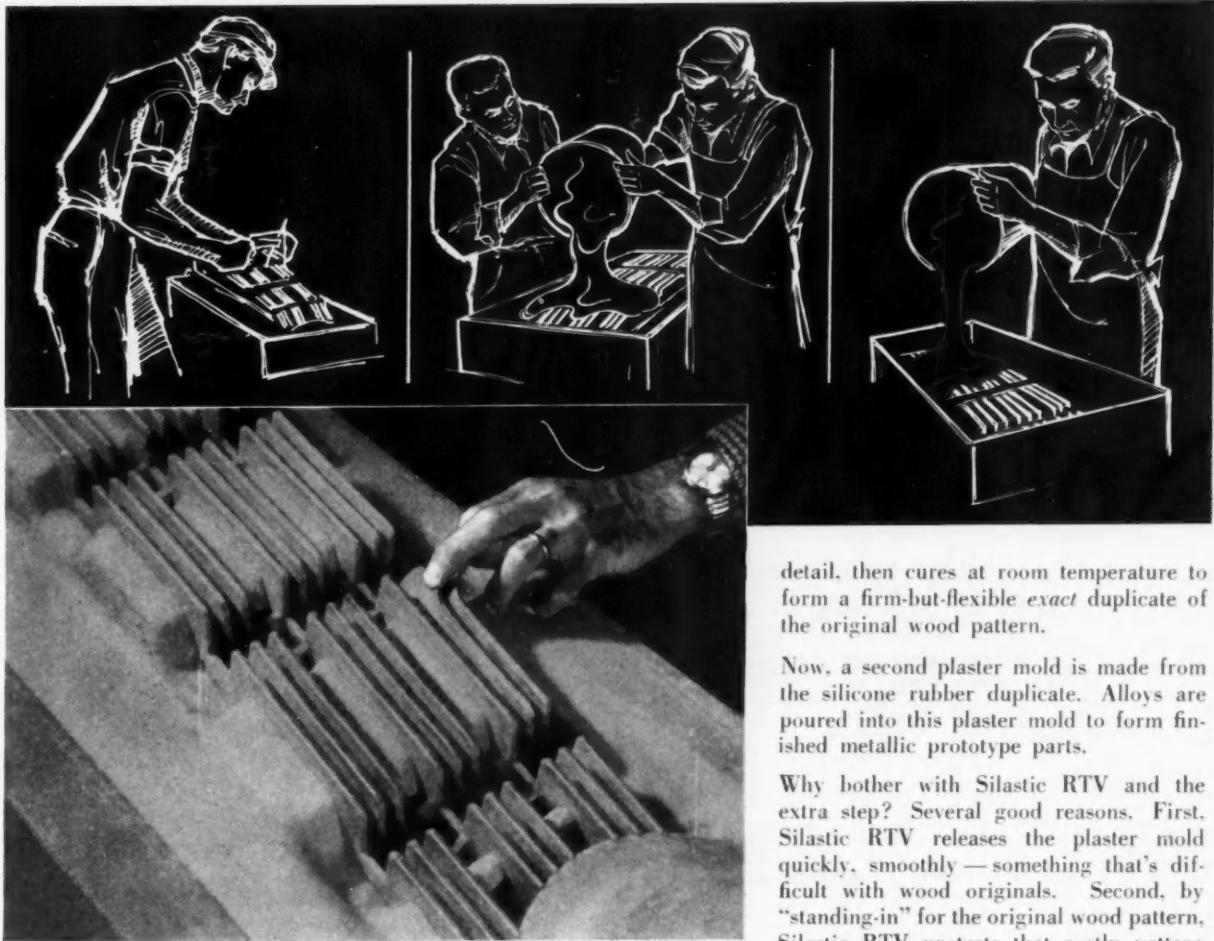
Hyatt considers compactness, too, and delivers a package bearing. Lubricated for life, it consists of a pair of spherical bearings, seals, and the bearing housing . . . complete and ready for immediate installation. Just one unit accommodates both radial and thrust loads as well as misalignment.

If you like to apply progressive bearing engineering to your design problems, call your nearest Hyatt Sales office. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT HY-ROLL BEARINGS
FOR CARS AND TRUCKS

IN ROLLER BEARINGS HYATT IS THE WORD FOR  RELIABILITY

Perfect Prototypes...Fast!



Silastic RTV puts designs into 3-D easily, quickly, economically

Turning intricate designs into prototypes and finished parts is greatly speeded and simplified with Silastic® RTV, the versatile fluid silicone rubber that vulcanizes at room temperature. Prototypes made with this new engineering "tool" are exact reproductions of the original patterns.

How it's done.

Here's how one automotive parts supplier uses Silastic RTV in producing small quantities of experimental grilles. The first step, illustrated at top, is a precise wooden pattern of the design. Next, plaster is poured over this pattern to form the first mold. Then, Silastic RTV takes over. This fluid rubber flows easily into the plaster mold, conforming to the finest

detail, then cures at room temperature to form a firm-but-flexible *exact* duplicate of the original wood pattern.

Now, a second plaster mold is made from the silicone rubber duplicate. Alloys are poured into this plaster mold to form finished metallic prototype parts.

Why bother with Silastic RTV and the extra step? Several good reasons. First, Silastic RTV releases the plaster mold quickly, smoothly — something that's difficult with wood originals. Second, by "standing-in" for the original wood pattern, Silastic RTV protects that costly pattern from harm. Another important benefit is durability. The silicone rubber duplicate can be used over and over again!

Silastic RTV resists temperatures up to 500 F, enabling you to make prototypes directly from the RTV mold with plastics. Examples: trim parts, instrument panels and many other parts important to overall design and beauty.

Every day more and more engineers turn to Silastic RTV for help in cutting costs, in reducing time requirements, in pretesting of new designs. How can this versatile material best serve *you*? Investigate today.

For detailed information on Silastic RTV, contact the Dow Corning office nearest you, or write Dept. 0910.

first in
silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.



KEPS®

**SAVE EXTRA MOTIONS...
BY THE MILLIONS!**

Eliminate an extra operation, repeated by the millions, by using KEPS, the quality fasteners with the built-on "lock washer." KEPS torsion-points grip firm, hold fast, for product dependability and customer satisfaction. A complete line of standard fasteners is available on fast delivery from National Lock ... also, special purpose fasteners engineered to your "specs." Write us.

KEPS, registered trademark
of Illinois Tool Works



NATIONAL LOCK

PASTENER DIVISION

NATIONAL LOCK COMPANY

ROCKFORD, ILLINOIS



FOR STRENGTH AND SAFETY... YOU CAN'T BEAT A PROPER FRAME!

As it is with the Mackinac Bridge, the frame—or skeleton—is a vital part of modern passenger cars and trucks—is, in fact, the backbone of the vehicle. And, when all of the factors of rigidity, durability and load support are considered, the *separate* frame provides many important advantages over the unitized concept.

The separate frame benefits both car manufacturer *and* car owner. It's safe, absorbs road shocks with less noise transfer, offers more resistance to stresses and strains. The separate frame allows for flexibility as well as quick design changes—and it permits body repairs and replacements at lower cost.

The separate frame is not a static unchanging structure. Through the years its design has been constantly revised to meet new requirements for passenger comfort and safety. It will continue to be adapted to new driving and styling trends as they occur in the future.

For over 50 years Parish has been a leading producer of frames for passenger cars. We will be happy to place our extensive facilities and product know-how at your disposal in connection with any automotive frame or structural problems you may have.



PARISH PRESSED STEEL

DIVISION OF DANA CORPORATION • READING, PENNSYLVANIA

Link-Belt's
narrow automobile
timing chain
started...

an 11-year economy run

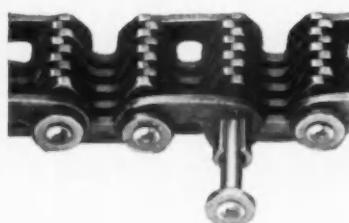
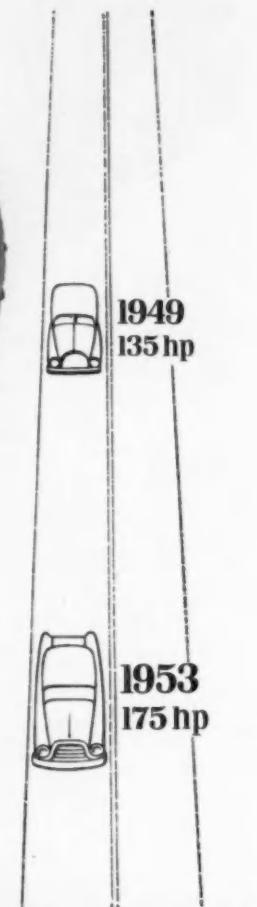
Narrow chain accommodated
100% hp increase, saving
millions in production costs

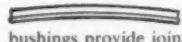
Introduced in 1949, Link-Belt's narrow, $\frac{1}{2}$ inch pitch timing chain is still "in time" with today's higher horsepower, higher compression engines. Even with the 100% increase in horsepower over the last eleven years, the exceptional durability of this chain has helped keep engines running smoothly, quietly, and dependably.

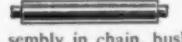
Today, this narrow timing chain is the choice of three of the four major auto manufacturers. It's been time-tested and performance-proved in millions of car miles.

Link-Belt engineers are readily available to help you find the potential savings in applications of Link-Belt narrow timing chain for your engines in the planning stage. For the complete facts and economic advantages, write for Book 2065.

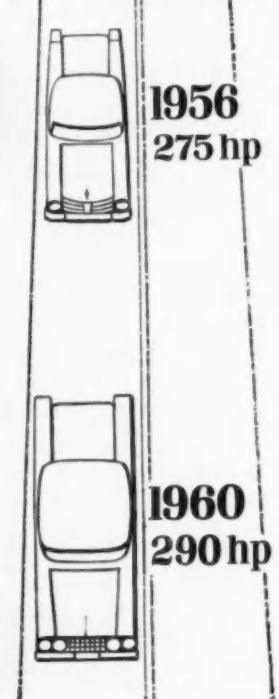
15.301



 Bowed segmental bushings provide joint snugness.

 After initial assembly in chain, bushings are straight.

 Bow in bushings acts to keep a snug joint on nonload side, arresting chain whip, providing a smoother, quieter, long-life drive.



LINK-BELT

TIMING CHAINS AND SPROCKETS

LINK-BELT COMPANY: 220 South Belmont Ave., Indianapolis 6, Ind.

ORIGINATED BY LINK-BELT, the bushed joint and free rotating pin were designed for quietness, smoothness and long life. Millions of cars on the highways attest to the success of this design. Note absence of connecting links and solid guide links that add weight to chain and increase centrifugal loading.

SAVE 3 WAYS

on production costs



1. Speed up assembly by reducing the number of motions on the production line with Eaton-Reliance Springtites—which are bolts or screws preassembled with spring washers. Scientific light-line studies prove many motions are eliminated by using these fasteners.
2. Keep inventory balanced and make stock handling easier by always having the number of spring washers equal that of the screws or bolts. This also saves on paper work by reducing the number of stock requisitions and orders.
3. Minimize “sweep-out” waste by using one preassembled fastener instead of two fastener components. Being easier to pick up, springtites are less apt to be dropped, lost and wasted. In hopper-fed operations, preassembled fasteners are more efficiently and easily handled.

Eaton-Reliance Springtites are made from top quality steel, cold drawn to rigid specifications in the Reliance mill.



EATON

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Los Angeles

AUTOMOTIVE INDUSTRIES, October 15, 1960



**EATON-RELIANCE
SPRINGTITES®**



*Write for
our new 16 page
full line catalog
containing complete information.*

— RELIANCE DIVISION —
MANUFACTURING COMPANY
553 CHARLES AVENUE • MASSILLON, OHIO

Circle 188 on Inquiry Card for more data

ORDER AFTER ORDER AFT
TER ORDER AFTER ORDER
ER AFTER ORDER AFTER O
ORDER AFTER ORDER AFT
TER ORDER AFTER
ER AFTER ORDER

Stainless Sheet...Exactly the Same Order After Order...From A-L

Every lot of stainless sheet will go through your plant with consistent good results when the stainless is from Allegheny Ludlum. There will be none of the hidden costs that come from production delays due to variations. That's because A-L stainless sheet is processed under strict quality control—from chemistry to finished gage to pickling solutions and right on through the entire cycle.

A-L quality control extends to you, the user. Our mill people make regular visits to check on the quality being furnished customers. You need only a phone call to get help in processing stainless from Allegheny Ludlum.

Evidence of the consistent high quality of Allegheny Ludlum stainless sheet is seen in polishing. Often polishing costs of A-L stainless sheet are half that of competitive material. Remember, all A-L finished stainless sheet stock is made to polishing quality standards.

For consistent temper, tolerances, and finish in flat rolled stainless products, call your Allegheny Ludlum salesman, or write: *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. A1-10.*



ALLEGHENY LUDLUM

EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT



1713

Mr. S. E. Miller,
Vice President and
Division Manager
of American Bosch Arma,
shows the hundreds
of items which go into
the manufacture
of a fuel injection pump
(upper left of table).

IBM MOS

...TRIPLED SAVINGS ANTICIPATED WHEN SYSTEM IS EXPANDED!

American Bosch has turned to IBM's new systems techniques for faster, more sensitive control of its manufacturing cycle at the Springfield, Massachusetts, plant. Utilizing the IBM Ramac 305, the Management Operating System has been applied to Materials Planning and Inventory Management, and large savings have already accrued.

These additional savings are expected from methods now in use:

- Sharp reduction of machine setup costs.
- Standardized production levels, to minimize manpower fluctuations and concentrate inventory dollars on active sales items.

MANAGEMENT OPERATING SYSTEM
SAVES AMERICAN BOSCH \$120,000
YEARLY ON SHOP ORDERS ALONE

- Substantial time reduction in production schedule changes.
- Automation of annual standard cost revisions, with a 70% expense cut.

When the Management Operation System is extended to other areas, American Bosch estimates that savings will be tripled.

MOS can be applied to most industrial operations, with specially trained manufacturing representatives to assist you. IBM Balanced Data Processing provides comprehensive support in applying the system to your company's operation. For full information, call your nearest IBM office.

BALANCED DATA PROCESSING

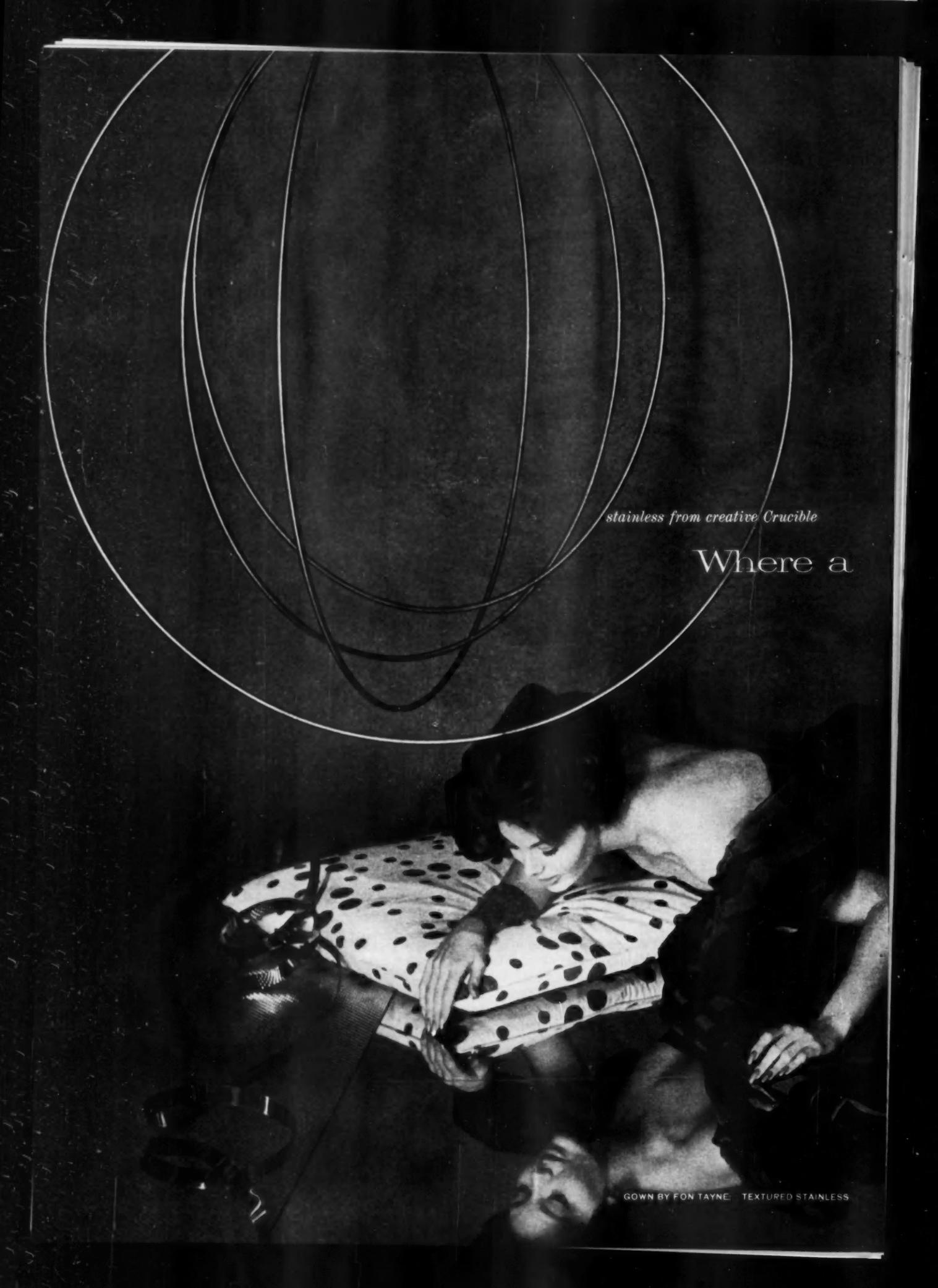


Circle 190 on Inquiry Card for more data

IBM

Circle 191 on Inquiry Card for more data

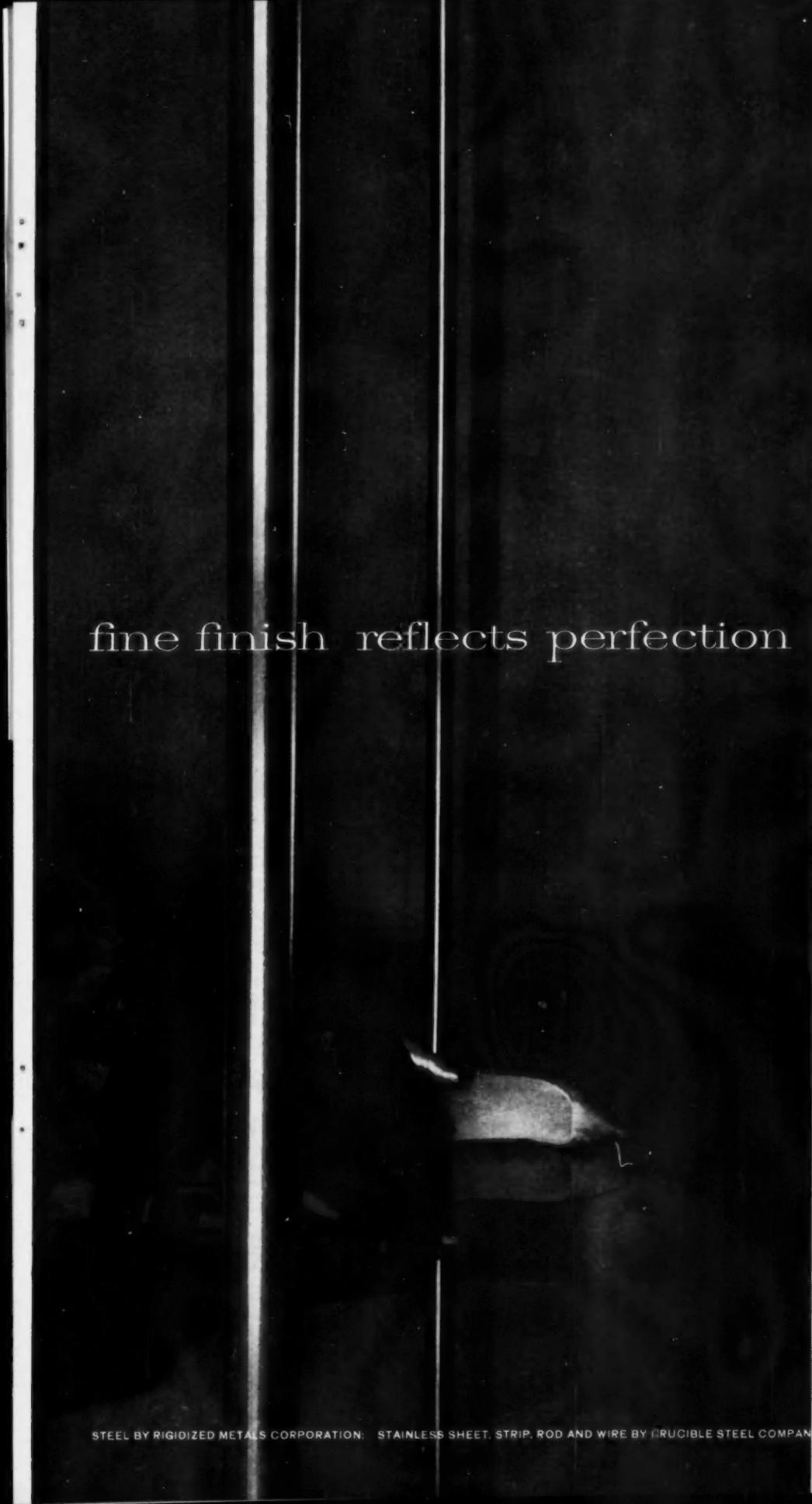




stainless from creative Crucible

Where a

GOWN BY FON TAYNE TEXTURED STAINLESS



fine finish reflects perfection

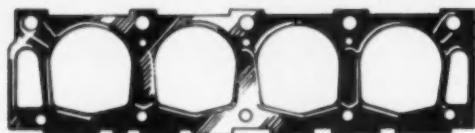
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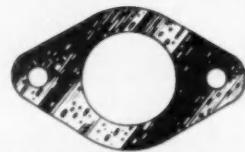
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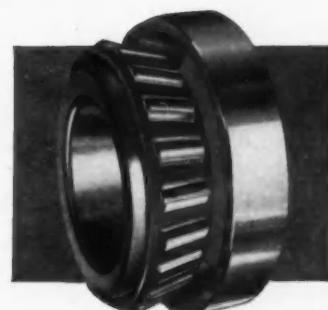
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Whether you build, buy or maintain trucking equipment—or *any* product that uses roller bearings—ask for Bower first. You can select from a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.



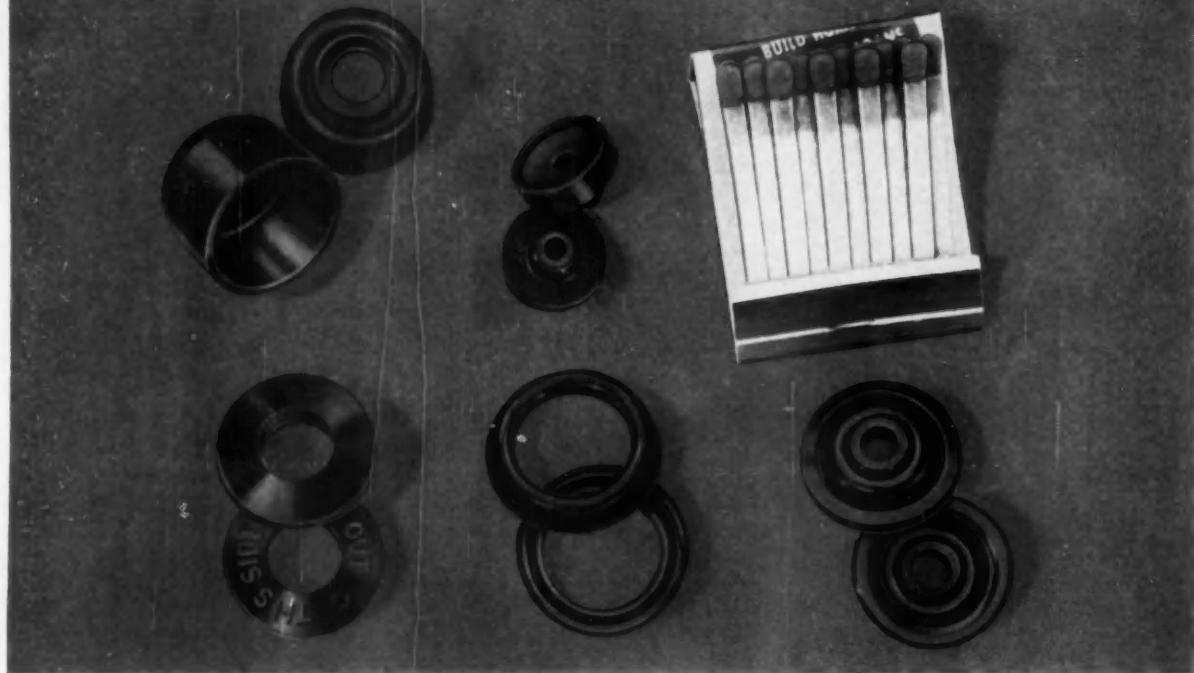
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Wide range of parts includes (top, left to right): valve stem deflector, condenser seal, (bottom) seal piston rod packing, universal joint seal, and oil seal. These vary in dimensions up to 1½" in diameter and 1" in thickness.

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Precise tolerances within ± 0.003 in. are now possible in large volume production of custom-molded rubber component parts. Ohio Rubber's new high-speed, continuous molding process produces such parts at rates of up to 200,000 pieces per day.

Greater precision, which results in important savings on finishing costs, is assured through use of single-cavity, self-registering molds. They permit accurate, uniform application of pressure to minimize flash—maintain consistent tolerances for all dimensions. Uniform material thickness is equally assured by a plasticizing mill, which as an integrated part of the process directs uniform charges to each mold.

Direct feeding, from the mill to the mold wheel, eliminates the conventional intermediate extrusion step and further

insures part uniformity and quality consistent with specifications. The continuous process permits *precise* control of time and temperature for each part.

Large volume production results in substantial cost savings for small, precision parts requiring tolerances obtainable by other precision molding processes. For parts formed by less precise, conventional methods, performance can be improved through greater accuracy—and without prohibitive increase in cost.

Quantity requirements involving 500,000 or more parts annually are

recommended for most advantageous use of the new process. Since two similar parts of different size can be produced simultaneously by alternating the molds on the molding wheel, lower production runs which might not be economical can be combined with a separate order.

Complete information on this revolutionary new process is available in bulletin form. Send for your free copy today. At the same time, be sure to inquire about Ohio Rubber's complete component "Customeering" service—molding, extruding, and bonding-to-metal. Just mention ORCO Bulletin 715.

DE-260

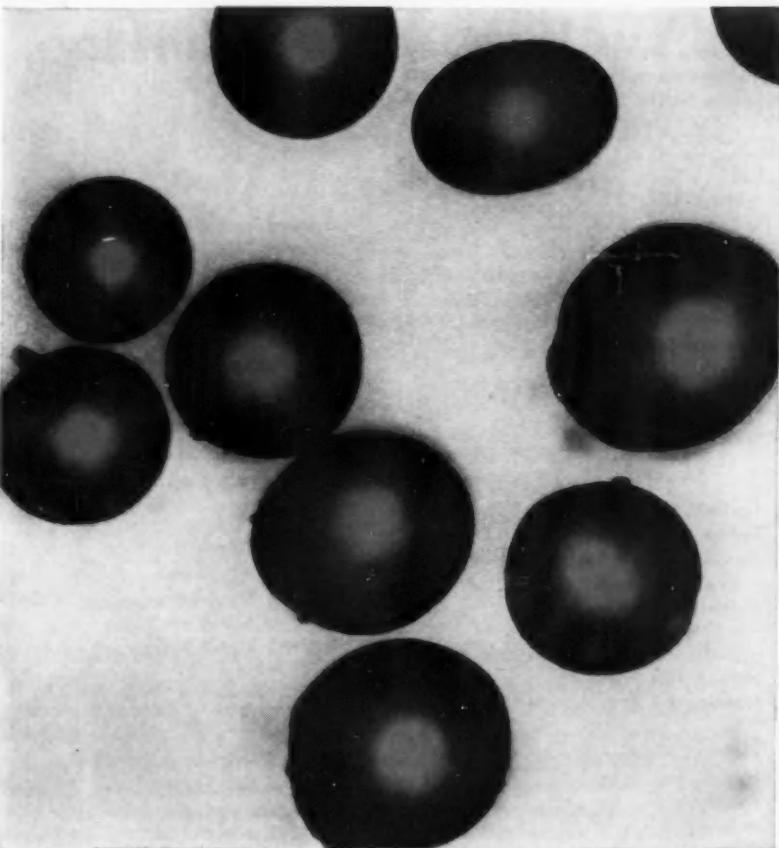


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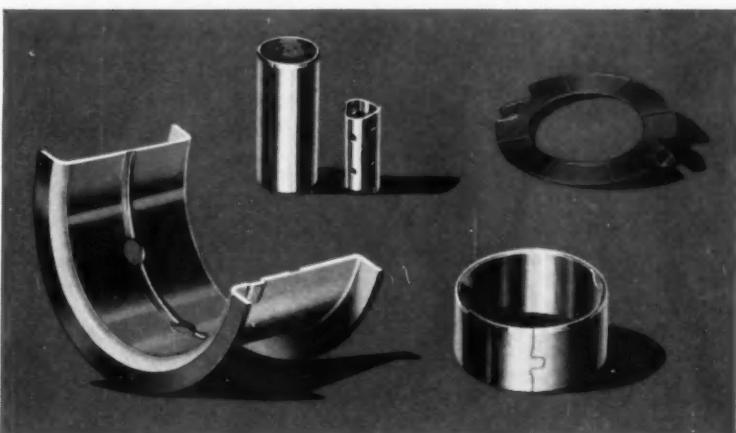
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INTO UNIFORM PARTICLES** . . . so small that thirty million will form a thin layer only one inch square! This sintered layer is the bearing surface of Federal-Mogul sleeve bearings.

Molten copper-lead, alloyed to exact specifications, is poured into a special inert-atmosphere reaction crucible. Here it's blasted by a high-speed fluid jet to form the dense powder shown at left.

Because of the uniform particle size of this powder, the bearing surface of each F-M copper-lead sleeve bearing has precisely the same alloy composition and high adhesion to the steel backing as every other F-M bearing of the same alloy type!

YOU CAN SEE THE CONSISTENT SIZE in the photomicrograph. What you *can't* see is the consistent alloy composition which produces uniform bearing properties and performance in any alloy type.

Federal-Mogul makes engine bearings for every condition of speed and load. You can select from among five different sintered copper-lead alloys, all permanently bonded to precision-formed steel backing. Our Engineering Department is available to you for consultation or recommendations on bearing design and application. For more information, write Federal-Mogul Division, 11037 Shoemaker, Detroit 13, Michigan.



A COMPLETE LINE! Steel backed bearings with a selection of many different alloys for virtually any bearing application—Plain and bimetal bushings in bronze, steel or aluminum. Precision thrust washers in solid bronze, or sintered alloys on steel (one or both faces). Rolled split spacer tubes in steel, aluminum or stainless.

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sleeve bearings
bushings · spacers
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By C. J. Kelly

ASSISTANT EDITOR

Electrode Selector 1

A pocket slide chart provides finger-tip accessibility of pertinent resistance welding data. The 9 1/4 by 4 in. chart selects the proper electrodes for joining many commonly-welded ferrous and non-ferrous alloys. Correct top and bottom electrodes are indicated for more than 160 combinations of alloys. The chart also includes data for determining the proper spot welding and seam welding schedules for various thicknesses of low carbon steel with a conversion table for other alloys. *Ampco Metal, Inc.*

Product Production 2

A new 16-page bulletin describes how engineered protection against shipping/handling damage can be achieved. Bulletin number 716, entitled "Shipping Container Mounting Systems" presents basic considerations in design and selection of systems for in-transit shock and vibration control required for various methods of transportation. Specific examples of elastomeric mounting systems in the aircraft, missile, electronic and general industrial fields are illustrated. *Lord Mfg. Co.*

Drive Catalog 3

The opening pages of a new 24-page catalog explain how super wedge drives reduce drive size as much as 50 pct, and permits drive cost reductions as substantial as 20 pct, with no loss in hp capacity. Drive selection tables, hp ratings, sheave dimension tables, and installation instructions covering belts, sheaves and bushings make the catalog a book of genuine practical value for the machine designer and the production man. *Service Div., Maurey Mfg. Corp.*

Noise Control 4

New, eight page booklet K4G gives engineering specifications and performance data for 26 types of products for the control and measurement of machinery vibration, shock and noise. Actual installation photos show a variety of equipments and tell how typical problems were solved. A special feature is the easy-to-read selector chart covering a wide range of equipment, showing recommended and alternate methods of isolation; also indicating when concrete foundations are necessary. *The Korfund Co.*

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ASSISTANT EDITOR

Safety Device 5

Bulletin WS-60 describes the installation and operation of a safety device that detects water in enclosed type oil quench tanks. Information includes several illustrations that show the components of the water sentinel as well as the installation of the unit. A graph shows response time for different water contamination levels of quenching oil. Directions on how to order the water sentinel are also included. *Ipsen Industries, Inc.*

Resistance Welders 6

This new eight page brochure contains tables which simplify calculation of the electrical power supply required by resistance welders. Factors of electrical demand and duty cycle are tabulated to establish minimum welder transformer KVA ratings (in accord with Resistance Welder Manufacturers Association standards). Maximum safe rate of operation of a welder can be readily determined by use of these tables, which establish the maximum electrical duty cycle of a transformer under various demand loads. *The Taylor Winfield Corp.*

Torque Data 7

Entitled "Master Power Portable Air Tools for Screwdriving and Nutsetting," this book, rather than simply a catalog of products, is a complete tool-selection manual concentrating on torque ranges from 2 to 160 in. lb. Designed to solve the problem of specifying a particular tool for an application without time-consuming trial and error methods, this easy-to-read, comprehensive literature has been prepared to furnish manufacturers with a fast guide to selecting the proper units for specific applications. *Master Power Corp.*

Shaft Assemblies 8

Catalog number 6094, illustrating light duty flexible shafts and flexible shaft couplings, lists in detail, many types and sizes of standard flexible shafts and couplings ready for installation as well as the more popular component parts. Typical core properties are also given for engineering evaluation. Included are various design techniques which will assist engineers in applying flexible shaft assemblies to their engineering projects. *Kupfrian Mfg. Corp.*

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Flame Hardening 9

Clearly illustrated and diagrammed, this brochure discusses the various problems of oxyacetylene flame hardening and shows how these problems can be solved. All available equipment for the process is discussed — from standard heating torches and tips and water-cooled flame hardening torches to gear hardening equipment adapted to use with the No. 20 Radiograph, a portable machine carriage that operates on a tongued and grooved steel track. The machine is ideally suited for flat surface and gear hardening operations. *Air Reduction Sales Co., a div. of Air Reduction Company, Inc.*

Honing Catalog 10

This new 16 page catalog describes internal, external, and straight line honing. The development of honing and the honing process are explained, and typical honed parts are illustrated. Charts list spindle speeds and coolants for various honing operations. Included in the catalog are illustrations and specifications for the company's line of honing machines, tools, and abrasives. *Barnes Drill Co.*

Hydrogen Gas 11

Produced at low cost, and with low initial investment, from commercial anhydrous ammonia using a newly developed absorption process, is described in new four page bulletin. Included are pictures of the compact plant and flow diagram. Capacities from 750 to 10,000 CFH or more. *The Electric Furnace Co.*

How Others Do It 12

This "How Others Do It" publication contains ideas submitted by plant engineers and electricians showing how they've used snap-action switches to increase production efficiency. Illustrated by drawings and photographs, this 29th issue contains five methods which can save man-hours, protect operators and machinery, and eliminate waste. The lead story tells how 34 precision lighted pushbutton switches help fans keep pace with speedway racing action. *Micro Switch, a Div. of Minneapolis-Honeywell Regulator Co.*

Testing Machines 13

"Tinius talks about the role of electronics in testing machines" is the title of an informative eight page brochure. This brochure traces the development of the electronic null balance principle used on the Selectorange indication system, as well as in stress-strain recorders and strain instrumentation. Recent developments in automatic read-out systems for printing ultimate and intermediate test data, such as yield strength, and low capacity load cells are also discussed. *Tinius Olsen Testing Machine Co.*

Welders 14

A new 12 page brochure, in color, illustrates and describes a line of resistance welders, in all phases, spot, projection, seam, roll seam, portable welders, aircraft spot and seam, flash, multispot and automated machines. *The Federal Machine & Welder Co.*

Jet Cleaner 15

Bulletin 446 contains information on the installation, operation and maintenance of the "Super Booster" hydraulic jet cleaner, which the company has developed as the most powerful jet tool in its line of cleaning equipment. The four-page bulletin describes installation, operating and maintenance procedures. A line drawing shows a typical unit installed, in relationship to supply lines and a detergent tank. Input and discharge conditions are listed tabularly, including capacities in gallons per hour, pressures, and temperatures at discharge. The method of introducing detergent into the discharge stream is also explained. *Sellers Injector Corp.*

Electrode Chart 16

A new 23 by 35 in. electrode wall chart gives description, number, color code, mechanical properties, size, current range, procedure and application information on the complete line of Hobart arc welding electrodes. Other valuable welding information covers welding symbols, welding arc, causes and cures of common welding troubles, typical deposition rates and a metal hardness conversion table. *Hobart Brothers Co.*

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ASSISTANT EDITOR

Instruction Manual 17

An entirely new 56-page welding, brazing and soldering alloy and flux catalog and instruction manual is offered. Physical properties, major uses, detailed application instructions and the latest techniques for welding, brazing, soldering, cutting and hardfacing are included for a wide line of products for joining all commercial metals. Helpful charts and tables summarize alloy selection and properties. Products are indexed by major metal use. *All-State Welding Alloys Co., Inc.*

Torque Manual 18

Thirty-one pages of application illustrations, bolt charts, discussions on assembly characteristics, instructions for torque wrench testing, pictures of modified and special torque wrenches, formulas and illustrated explanations for using adapters, attachments and extensions. There are six pages of illustrations and explanations on using a torque wrench correctly. There are 116 illustrations, seven tables, and a complete table of contents. *P. H. Sturtevant Co.*

Rubber Facts 19

A new, 4-page brochure contains all the facts on Silastic LS, fluorosilicone rubber. Illustrations show Silastic LS at work as a lip seal

in a radar scanner and a flexible fuel line coupling in a jet airplane . . . graphs show the outstanding performance of Silastic LS during oven agings and ASTM oil exposure tests. Typical properties and practical tables suggest when to design with Silastic LS for applications requiring solvent, fuel, oil and fluid, and chemical resistance. *Dow Corning Corp.*

Cleaning Data 20

A 12-page, illustrated booklet discusses industrial batch cleaning in some detail—citing the efficiency of different methods and their effectiveness on parts in a range of sizes. *Magnus Chemical Company, Inc.*

Glass Fiber 21

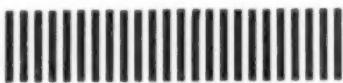
Technical data on properties of glass fiber are featured in this bulletin. Descriptions of the product show performance data meeting the requirements of MIL-C-17435 and MIL-C-7769 specifications. Applications of fiber glass are listed, particularly for use as package cushioning and for vibration damping. The literature also shows application of glass fiber to machine base mounts, acoustical isolation and molded insulation. *Fibrous Glass Products, Inc.*

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progress report

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